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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS.

Friday, January 3, 1930

NOT FOR PUBLICATION

ANNOUNCEMENT: Every two weeks at this time our Wilds Man tells us about his visits with Uncle Sam's Naturalists. Today he will tell of his talk with Mr. E. N. Munns, in charge of the Forest Experiment Stations of the U. S. Forest Service. They talked about the wildest of the wild country left in the depths of our forests and why the government plans to keep such areas wild.--------

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One of our big boyhood heroes was the American pioneer with his ax. He certainly did a wonderful job. He won a hard fight against the forces of nature in blazing the trail and clearing the wilderness, for us.

Nowdays, in the East, it is hard to find forest areas in their natural, primitive condition. Our Northeast has been over-run by white man now for two hundred years. There are few sections which have been free from man's influence. In the South, it is much the same. In the West, too, changes are going on fast.

In fact, nearly all of us have noticed, right around us, the wilds getting tamer. You remember, not so many years ago, President Roosevelt hunted big game in the canebrakes of Louisiana. Now it is hard to find a canebrake. Continued use of fire and overgrazing by hogs has practically eliminated them.

One reason why the Forest Service is now setting aside some of the few remaining primitive forest areas to keep them wild is so we can see just what the Indian, and the fur trapper, and the pioneer settler were up against.

But, as Mr. E. N. Munns, in charge of the Forest Experiment Stations, of the U.S. Forest Service, points out to me there is another and maybe bigger reason why the government is setting aside wild areas to keep them wild. Some of these wild sections are being reserved so our foresters can get to the roots of many questions on how to grow trees.

For example, Mr. Munns tells about the former fir forests of southern Germany. When the fir was cut off, spruce was planted. Well, sir, that spruce flourished at first. The foresters congratulated

themselves. Then it began to produce poorer timber. The forest seemed to go into a decline. Evidently some change on a big scale had taken place.

Naturally, the timber experts thought of going back to nature, to check up on what they had done to the forest or to soil when they took the wilds out of Nature's hands, as it were. But they had no place to go. There were no areas in the primitive state left.

Such experiences as that have led Germany, Italy, and other European governments to set aside sections in the forests where the wilds are given a chance to come back.

But right here in this country, Mr. Munns says, we have similar problems. For instance, in our Southern States we have a belt of country where practically the only commercial timber is long-leaf pine. That region has been considered as strictly a long-leaf pine region. Now, however, foresters have found in certain isolated spots, slash pine grows well, far beyond what used to be considered the range of slash pine.

Mr. Munns thinks that once there were thousands of acres of the fast-growing slash pine in the long-leaf pine country, the whole area of which has for years been completely burned over on the average of once every two years. It would seem that the slash pine was destroyed and the long-leaf pine survived because the long-leaf pine is better able to stand fire. But we can't say this, Mr. Munns declares, because we have no primitive area which has been kept free from the woods burning practice of the people of that region; where we could go to observe what happens where the wilds are left untouched.

So you see how important keeping sections of the wilds wild may be. For lack of an example of what happens in that particular region when nature is left to take its course, foresters don't know whether it would be wise or not to reforest land in that region with the quick-growing slash pine for wood pulp.

Wood is a crop -- but it is a long-time crop. With farm crops which are planted and harvested in a season, the grower can see the effects on the soil and work out rotations which will keep his land in crop growing condition. But that's not nearly so easy with wood land. The time it takes for the wood crop to mature is so long compared to the life of the individual grower that the grower needs some place he can check up on Nature's crop rotations.

Among foresters, Mr. Munns tells me, there is a saying that, in a mature forest, growth is equal to decay. What is lost by decay is made up by new growth. Left to itself, according to this idea, the forest would hold its own indefinitely. But under certain conditions, with fire and disease epidemics among the trees, the decay may be more

than the growth. There may be a net loss. To know what really happens, and how to keep the balance if need be, some parts of our forests must be left untouched.

We said these wild areas may help the foresters get at the roots of many puzzling problems in tree growth. In fact, as Mr. Munns points out, timber growing problems not only extend to the litter on the forest floor, but down through the litter to the roots of the trees and the soil around the roots and the millions of tiny bacteria and fungi which inhabit the soil.

In many cases, he says, it may be that in reforestation of some species of trees we will have to inoculate the soil with certain growth-promoting fungi in much the same way farmers in many sections have to inoculate their soils with certain nitrogen-fixing bacteria in order to grow clover and alfalfa.

Something of that sort has already been done in the case of trees in a section of Australia where trees apparently would not grow. That is, the trees would not grow, until one grower tried bringing litter from a forested section and spreading it on the soil where the new stock was planted. Then the trees began to flourish. The scientists claim this remarkable change was probably brought about by one of the many sorts of tiny fungi found by millions in the forest litter. They have not yet identified the exact soil inhabitant which did the work.

Anyway that illustrates how delicate the balance of nature in the forest may be, and how important it is to have some areas left in their primitive condition. Such primitive areas are now only found within our National Forests and in some of our National Parks. Some of those primitive areas are being set aside for study in forest growing. Others are being set aside as living museums into which no motor roads will run, but where the trackless forests can be seen as the Indian and the early pioneer first saw them.

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ANNOUNCEMENT: Every other Friday Station_____ presents these visits with Uncle Sam's Naturalists, in the United States Department of Agriculture. Remember the day and hour when our Wilds Man will be back with us.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS

Friday, January 17, 1930

ANNOUNCEMENT: Every two weeks at this time our Wilds Man tells us about his visits with Uncle Sam's Naturalists. Today he has promised to tell us what Mr. C. E. Rachford, in charge of the grazing branch of the Forest Service, has to say about range for wild animals -- Well, Mr. Wilds Man--What about range for wild animals?---

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Of course, we all know big game animals; such as deer, and elk, and moose, and mountain goat, and mountain sheep, and antelope; need range. They must eat to live.

But I dare say, most of us think all we have to do is to set aside a bit of wild country, shut out the hunters, and then let Nature take its course. But from what Mr. C. E. Rachford tells me protecting big game is not so simple as it may seem to some.

Mr. Rachford is in charge of the grazing branch of the Forest Service, and he has found that there are several problems in providing range for big game. And in order to find the answer to those problems, we must know more about the habits of the animals than has ever been known by those most familiar with their ways. And we must not only know more about the animals, but more about the plants they feed on.

All these years, you might say, we have been crowding wild animals off part of their range. Most of these big game animals have always had summer and winter feeding grounds. As a rule, in the summer, they have fed on the higher slopes and in winter moved down to the lower country; the valleys and the low hills. But due to settlement and overgrazing and overstocking of cattle on public lands outside the National Forests, the winter range has been seriously decreased. Providing range outside the forests is one of the big problems in big game protection.

When any kind of wild animal on its natural range is given protection from hunters and predatory animals, it usually increases fast. In fact, the numbers of animals increase so fast, that there is soon not enough feed for all of them, Then they begin to starve. That has happened in the case of our elk and deer in certain areas. Some of the animals had to be removed to save the rest.

But, as Mr. Rachford points out, even before they get to the starving stage. they may damage the range so it won't support as many game animals as it did before. For example, a species of browse known as the cliff rose forms the greater part of the winter food supply of deer in northern Arizona. The cliff rose is what they prefer. But when that is gone they turn to less desirable vegetation and begin to eat that. These game animals get to eating the young conifer timber sprouts.

There you see how far an upset in the balance of nature may lead in a little while! Cases of heavy damage to conifer timber reproduction has been directly traced to changes in the diet of game animals due to their being forced to seek the less palatable food, because of the abnormal decrease in their num-

bers under protection.

There must be a best number of game animals to keep on any given range; so as to keep the range and the animals both in good condition. The foresters take a census of the different animals, on our National Forest ranges. At the times of the year when the animals are gathered together on the range, the Forest Service men make counts on representative areas, and then apply these figures to other parts of the range where conditions are similar.

They have several methods of checking up these counts. They check the number of animals killed by man and predatory animals, and then estimate the size of the herd that could produce that number annually. They run strips through representative regions, counting the animals seen and allowing for those not seen, by tracks and other evidence on the ground. They keep a record of all animals seen as to age and sex, and they estimate the acreage that animals inhabit.

Knowing how many animals are on the range at one time, however, is just a beginning. Mr. Rachford pointed out several other links in the chain of wild animal knowledge that need much strengthening. We need more information on how long different animals live, and the age at which they stop breeding--on the percentage of males to females necessary to maintain a fully productive herd--on the average increases of each sex in a given herd--on food habits, and on the kind and quantity of range necessary. We need investigations along practical lines to find out the differences between raising domestic livestock and wild livestock.

And, the Department of Agriculture, through the Bureau of Biological Survey, is gradually getting these necessary facts. They have already learned many things, and in the future they will get all of the information that we now lack. But it takes time. Meanwhile we must do the best we can to protect and conserve our wild animal supply and our wild animal ranges.

One of the main problems so far as range is concerned, is with deer. Numbers of deer increased almost 7 per cent in 1928, and the increase was pretty generally distributed throughout the national forests and states. As a result of protection deer are so numerous in some localities that their management is a serious problem. Provision must be made for removing the surplus in a way that serves an economic purpose, and at the same time allow the maintenance of range vegetation on which the animals depend for food.

With mountain goats and sheep the problem is a little different. They have been crowded back within their natural ranges until they occupy now only the roughest mountain regions. These unfavorable feed and climatic conditions, together with natural enemies, keep goat and sheep herds from increasing as they would if they were undisturbed.

States are helping to solve some of these problems through state game refuges. More than 100 National Forests now have state game refuges, covering approximately 20 million acres of land. And in addition the federal government has set aside some 2 million acres in forests as refuges on which domestic livestock aren't allowed to graze, thus conserving the range for wild animals. In fact, on all the state game lands the number of domestic livestock is held down so that there is adequate range for the wild livestock.

In some cases, where there has been a surplus of wild animals on a range, they have been transplanted to other ranges where the stock is running low. More than 100 National Forests, for instance, have been restocked with Elk.

In summing up, Mr. Rachford suggested three points that will help to preserve our game animals from extinction and to insure proper care. We need more scientific knowledge as to development and management; we need adequate and flexible game laws executed by non-political game commissions or wardens; and we need close cooperation between sportsmen's associations, livestock interests, and state and federal officials.

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ANNOUNCEMENT: You have just heard our WILDS MAN discussing the problems of preserving our wild animals and providing range for them. Station_____presents these visits with Uncle Sam's naturalists every two weeks. Our WILDS MAN will be back on Friday, January 31, for another chat.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, January 31, 1930.

NOT FOR PUBLICATION.

Speaking Time: 10 Minutes. All Regions.

BAG LIMITS REDUCED ON WATERFOWL FOR NEXT SEASON.

OPENING ANNOUNCEMENT: Today our old friend the WILDS MAN is going to tell us how many geese and ducks we will be allowed to kill in one day next season. The new Federal regulation has reduced the bag limits for waterfowl, and we are all anxious to learn more about it. The WILDS MAN has just had a talk with Uncle Sam's Naturalists, and he is ready to tell us about this new bag limit regulation. These Naturalists programs come to you regularly every two weeks through the cooperation of the United States Department of Agriculture and Station_____. All right, Mr. WILDS MAN.

--oOo--

Especially is it sweet if the old leading gander indicates by constant quacking that his flock is circling for an immediate landing nearby in a cornfield, or in the waters of a quiet lake or river.

But the wild goose, like the old gray mare, "is not what she used to be," 25 years ago. Wild life is slowly receding before the advance of civilization, and it has become necessary to increase the protection of waterfowl and other species of migratory game birds throughout the United States.

From my own hunting experience I knew that many of you radio listeners would be interested in knowing about the new Federal regulations affecting the bag limits for next season. So, I went over and had a talk with Col. H. P. Sheldon, the game conservation officer for the Bureau of Biological Survey. I might add that this branch of the United States Department of Agriculture administers the Federal regulations on migratory birds. Acting under the direction of Col Sheldon is a force of 25 United States Game Protectors.

Col. Sheldon pointed out that duck guns must go on the rack at sun-set on January 31 of this year. That's today, and it marks the close of the 1929-30 open season for hunting ducks, geese, and other migratory game birds all over the United States. When the season opens next fall, we'll have a new bulletin with some new regulations.

Now what are you going to do with the waterfowl and those game birds you have in cold storage? According to Uncle Sam's game officer you are allowed 10 days to eat the accumulated game on hand to-day, January 31, which is the close of the open season. That means all migratory waterfowl

should be out of cold storage and consumed on or before February 10. Violators of this law are subject to prosecution in a Federal court.

Now it happened that back in 1916 President Woodrow Wilson and King George of England decided that all the birds that migrate between the United States and Canada ought to be protected. Accordingly a Migratory Bird Treaty was signed by representatives of both countries on a hot day in August. Our present Federal game regulations are, generally speaking, an outgrowth of this treaty and of the Act of Congress that made it effective. They are amended from time to time to modify the protection needed by the wild fowl.

Here is a list of the migratory game birds that should now be safe from the hunter's gun until next season. It's against the law to kill these birds anywhere in the United States in the period from sun-set on January 31,1930, until sun-rise on the morning of the first day of open season in the fall of 1930. Lay off wild ducks, wild geese, brant, Wilson snipe or jacksnipe, woodcock, mourning doves, sora and other rails, coots, and gallinules until next fall.

Remember now that I'm talking about and giving the Federal regulations applicable throughout the United States for the protection of migratory birds. In addition to the Federal laws, the States have game laws of their own. Every hunter and sportsman should acquaint himself with both his State Game laws and those of the Federal Government. In some States the Federal open season for hunting waterfowl closed on December 31, in others on January 7, and in a few on January 15, today, January 31, being the final date anywhere in the United States.

Our Federal Government, in accordance with the Migratory Bird Treaty between this country and Great Britain, has jurisdiction over the migratory birds, and accordingly has set an opening and closing date for hunting them. However, States are permitted to enact game laws of their own for the further protection of these birds, but these State laws can not extend the open season beyond the Federal closing dates. They can, however, make the season as much shorter than the Federal season as they like.

I wondered why the closing dates for hunting varied from say December 31 in some States to January 7, 15, and finally 31, in others. Col. Sheldon said it was because the country was divided up into different natural zones. These zones are determined by the time of migration of the birds in that section, or by other factors governing the reproduction and protection of the birds as modified by latitude, and other natural factors.

There will be very few changes in the opening and closing dates of the next seasons, and these few will affect mourning doves in Florida and Texas, and rails and gallinules (except coot) in New York. With the commencement of the hunting season next fall, however, there will be several changes in the daily bag limits allowed the hunters.

These new bag-limit changes are established by recent amendment to the regulations under the Migratory Bird Treaty Act. They were recommended by the Biological Survey, adopted by the Secretary of Agriculture and approved by President Hoover on December 31, 1929, just one month ago. Here they are:

Change number one, The bag limit on ducks will be reduced from 25 to 15 ducks a day.

Change number two. The bag limit on geese will be reduced from 8 to 4 a day.

Change number three. A possession limit has been established under which no hunter may have in his possession more than two days' bag. That means he may not hold more than 30 ducks and 8 geese at any one time.

Why was this reduction necessary?

Secretary Hyde of the Department of Agriculture said the necessity for such a reduction has become evident from exhaustive field investigations by the Bureau of Biological Survey. The investigations made revealed the fact that waterfowl have not been holding their own during the past year. Furthermore, the unusual drought that prevailed on the breeding grounds during the past season was a hard one on wild life in many sections. The reclamation of large former breeding grounds in the northwestern States and Canada has resulted in cumulative losses of great areas of marsh and water. This, too, has been a hard blow to waterfowl.

The chief reason for the Migratory Bird Treaty between the United States and Great Britain was the realization that through indiscriminate slaughter and the lack of harmony in the open seasons in the different States and the Canadian Provinces the birds were threatened with extermination, as a result of inadequate protection during the nesting season and while on their migrations and on their wintering grounds.

In carrying out its defined responsibilities under the treaty, it is the duty of the Federal Government to protect these migratory birds. Uniform laws and seasons throughout the country have aided materially in this protection. And now, with the bag limit reduced, it appears that we should be able to enjoy our wild life for generations, if we'll only join in and cooperate with Uncle Sam in helping to carry out and abide by these regulations enacted for no other purpose than to make sure of the perpetuation of our wild fowl.

Forty-five States have shown their willingness to cooperate in this wild-life protection by passing laws on waterfowl seasons in harmony with the Federal regulations. Prior to the recent amendments 29 States had gone a step further by passing legislation reducing the bag limits below the Federal standards.

We need more than the restrictions themselves, however, if our wild life is to be preserved for all time. There must be a sound public sentiment in favor of the observance of the game laws already in force. There must also be a willingness on the part of sportsmen and others interested in the preservation of game birds to cooperate in their protection. Colonel Sheldon stated that if such cooperation were always received, then the protection of our wild life would offer no serious problem to the enforcement

officers. In return, sportsmen and others would continue to enjoy the sweet music of the wild gander's honk as he migrates back and forth across the country.

CLOSING ANNOUNCEMENT: You have just listened to the WILDS MAN talk about the new bag-limit regulation for next fall. These Naturalist programs come to you every two weeks through the cooperation of the United States Department of Agriculture and Station_____.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, February 14, 1930.

NOT FOR PUBLICATION

Speaking Time; 10 Minutes. All Regions.

UNITED STATES FOREST SERVICE CELEBRATES 25th BIRTHDAY.

OPENING ANNOUNCEMENT: It's been two weeks today since the Wilds Man told us about his last visit with Uncle Sam's Naturalists. On February first, he attended the 25th birthday celebration of the establishment of the United States Forest Service. That was quite an occasion, and the Wilds Man is going to tell us about it at this time in his regular Naturalist talk which comes to you every two weeks through the cooperation of the United States Department of Agriculture. All right, Mr. Wilds Man, let's hear about that Forest Service birthday celebration.

--ooOoo--

Only yesterday, figuratively speaking, the early settlers of this country had trouble in disposing of the giant trees of the forests. These silent sentinels stood everywhere, and the pioneers had to remove them by the hardest of labor before they could find space to cultivate their scanty crops. Trees were so plentiful in those early days that in many cases they became a liability rather than an asset. Saw-logs, so big, and so fine that the sight of them today would cause the eyes of the average mill man to bulge with delight, were piled high and burned into worthless ashes.

That was yesterday-----in the beginning of this country----- in the days of the bear, the deer, the buffalo and the Indian. Today, we have a different picture Railroad tracks reach out across the country in a mighty iron network. Airships and airplanes buzz overhead, while automobiles break Nature's wooded silence. The Indians are fewer, wild life has been reduced, and slowly but surely our giant trees of the forests are dwindling. This is a regrettable affair, and the United States Department of Agriculture is not going to stand by and see our natural scenic beauty destroyed without putting up a strong protest. C. E. Randal, one of Uncle Sam's Forest Service men is giving out public information about our forests, forest conditions, and how the United States Forest Service is trying to remedy the situation ------ and save our trees in an orderly and economic fashion.

For 25 years our far-sighted Government has been watching, studying, and guarding the forests of this country. In the case of the National forests this guardianship has been direct and complete. However, Uncle Sam's interest did not stop there. He has lent a helping hand to the big mill man, or to the little farmer/out on the hillside, whenever they indicated that they wanted help or assistance in establishing, growing, or even taking better care of the forests.

So it was fitting that, on the afternoon of February first, forest workers from all over the country should gather in the auditorium of the National Museum in Washington, to celebrate the 25th birthday of the United States Forest Service.

The UnitedStates Army Band furnished music for the occasion, and some of our most distinguished citizens took part in the program. Assistant Secretary of Agriculture R. W. Dunlap, ex-Gov. Gifford Pinchot of Pennsylvania, first chief forester, Senator McNary of Oregon, Representatives Clarke of New York, Woodruff of Michigan, Englebright of California, Leavitt of Montana, and Major R. Y. Stuart, chief of the United States Forest Service, and others took part in this program celebrating the 25th birthday of Uncle Sam's Forest Service.

In 1876 our Government took notice of forestry conditions in this country and called attention to our disappearing trees. The United States General Land Office had a forestry department, and the Department of Agriculture had a forestry bureau. On February, first, 1905, these two forestry divisions were combined together into one big branch of the Government known as the Forest Service of the United States Department of Agriculture. That was 25 years ago, and there are now 65 men and women still in the Forest Service who witnessed the beginning of this great national bureau.

According to the stories told at this birthday celebration, 'old-timers' in the forest work had a colorful history. Some of them told about their part in bringing to an end the bitter range wars between the cattle men and the sheep men over the use of the western ranges, and the early fights to save the public forests for the use and benefit of the public.

One 'old-timer' told an interesting story of the bad fire year of 1910. He had hardly taken his seat when another 'old-timer' rose and told how much worse the fire year of 1929 was. These veterans fight forest fires, keep a watch on the timber, and render many other valuable services to the public. Their lives are lived in close touch with Nature, and they gather stores of forest lore as they keep watch on the towering trees that lift their heads skyward.

In the 25 years the Forest Service has developed into an organization which today has nearly 2,700 public servants permanently on its rolls. In addition to this, there are some 2,800 forest guards brought in to help fight fires during the fire season. Fire is one of the tree's worst enemies in dry regions. It rolls along on the ground until in reach of green foliage, and then leaps from bough to bough until the once beautiful trees are left darkened and ruined sentinels. The Forest Service does everything it can to prevent those costly forest fires which destroy thousands of acres of splendid timber every year.

One old-timer calls special attention to the careless way in which we flip lighted cigars and cigarettes from speeding automobiles out into dry grass along the roadside. This is a little thing, but it has caused the loss of many acres of beautiful and valuable timber. It can be prevented, he pointed out, by thoughtful action on the part of smokers.

In addition to fighting fires the Forest Service administers as a public property 150 of our National Forests. The total area of these lands amounts to 160,000,000 acres. That's an area about the size of Texas which these Forest Service men look after all the time. That's no little job.

That is not all the Forest Service does. In addition to this direct protection and supervision of our National forests, the Forest Service cooperates with the States in fire protection to the extent that some degree of organized fire protection is given to nearly two-thirds of the entire forest area of the country.

These many contributions from the Forest Service have helped in making us more 'forest minded' and have given us a better understanding of our forest conditions today, but there is much to be done yet.

Practically every spring the Mississippi River overflows its levees, and covers thousands of acres of fertile lands with its muddy waters. Is this a forestry problem? It certainly is.

Forestry, floods, and soil erosions are all linked up together. Thousands of acres of watershed need better protection.

In addition to these services I have already mentioned, the Forest Service has taught many farmers in this country that it is profitable to grow a crop of trees just as we grow a crop of corn, cotton, or wheat. Of course it takes longer to grow a crop of trees than it does a crop of watermelons, but the profit is there when the project is well managed.

I can't begin to tell you all that happened at this birthday celebration, in the 10 minutes allotted to me, but in conclusion, I want to say that the 25th birthday celebration of the United States Forest Service was an outstanding event. It marked a milestone of successful operations for a quarter of a century. Many 'old-timers' were present and told of the past; the constructive program for the future forestry work of this country was explained. You'll hear more about that as it takes form and unfolds for another 25 years of usefulness as great, we hope, as the past 25 years have been.

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CLOSING ANNOUNCEMENT: You have just listened to the Wilds Man tell about the 25th birthday celebration of the United States Forest Service. If you desire further forestry information write your State Forestry Department, or the United States Forest Service, Washington, D. C. Our Wilds Man will be back with us again just two weeks from this time.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

FEB 2 1930
U. S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS Friday, February 28, 1930

NOT FOR PUBLICATION

Speaking Time: 10 Minutes. All Regions.

CONTROL OF COTTONTAIL AND JACK RABBITS.

OPENING ANNOUNCEMENT: Every two weeks at this time our Wilds Man tells us about his visits with Uncle Sam's Naturalists. Today he is going to talk about controlling cottontail and jack rabbits. He got this rabbit information from the United States Biological Survey and then dressed it up with stories, dogs, guns, and hunting trips, so, if you can spare the time, come on and join the hunt. All right, Mr. Wilds Man.

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Well folks, get your guns and come on--- we're going rabbit hunting. Not going to do any real killing--------just a lot of talking. Rabbits are so plentiful in many parts of this country that, like the weather, they furnish a timely subject of conversation most anywhere. If our rabbits were trained soldiers we could capture the rest of the world without firing a single gun. But rabbits are not soldiers. One sagebrush farmer in the West once said, "A jack rabbit is an everlasting appetite with 4 legs to carry it around to 'pester' folks trying to make a living farming."

Before we get too far with this hunt I want to say that complete extermination of rabbits in any part of the United States is neither desirable nor possible. So, don't you rabbit lovers and rabbit hunters worry,----there'll be plenty of the four-legged hoppers left when we get through. In some sections of the West, jack rabbits are killed by the 10,000, and one man estimated that there were more than 12,000,000 in one State. We have jack rabbits west of the Mississippi River and cottontails east of that body of water, and just plain rabbits all over the country. They're in fence-corners, ditch-banks, hollow-trees, and as the Western farmer says, "sleep in the forks of sage bushes."

W. E. Crouch, of the United States Biological Survey, gave me some interesting facts about this 4-legged jumper with the long ears. Mr. Crouch aids the farmer in the control of rodents and predatory animals.

To start with let's cut our rabbits in two and make 2 big divisions. East of the Mississippi River we find Peter Rabbit and Old Molly Cottontail. Cottontail rabbits are plentiful in this section of the country. They are purely vegetarians, and have never been known to catch boll weevils or corn borers, or to aid the farmer in any way except to eat up his crops. They are troublesome pests in many sections east of the Mis-

sissippi. Their only good feature is the fact that they are good to eat and that it is sport to hunt them. Where they are too plentiful, they should be reduced in numbers to insure the safety of crops. How can this be done?

Before I answer that question, let me tell you something else. Peter Rabbit is keen and has a swift foot. He can give a dog a merry chase, and cause a hunter to say ugly words. Cottontail rabbits are 'dead-game' sports, and farmer boys and sporting men like to hunt them, because they are evasive, tricky, and often put a hunter to a real test. As a result of this trait sportsmen in many of the States east of the Mississippi have brought about favorable legislation to protect the cottontail rabbits. On one side we have the sportsman wanting to keep the rabbits, and on the other side the farmer wanting to kill every last one because they destroy crops. Well, that question is a lot more easily settled than the question of reducing our battleships. The farmer can kill, catch, capture, and scare all the cottontail rabbits he can, and the sportsman can raise more dogs and buy more guns, but when they both get through we'll still have rabbits nibbling alfalfa, eating cabbage, biting off sweet-potato plants and gnawing apple trees. Cottontail rabbits breed several times each year during the warm season, and the litters average 5 or 6 young rabbits. They are born blind, naked, and helpless, but they get out of that stage in a hurry if there is a clover patch near by.

Now let's get rid of the cottontails where there are too many. Nobody knows the best way, but here are some ways that may help. Eagles, owls, large hawks, wildcats, foxes, dogs, minks, and even housecats are sometimes fortunate enough to capture a cottontail.

Hunting has been the most important factor in keeping down rabbits, generally speaking. Late in the afternoon, or after rains in the summer, rabbits hop out of thickets to investigate the farmer's patch of Mammoth Yellow soybeans, and you may shoot them at that time if the law permits and you are a good marksman.

Rabbits are easily trapped, and this may help, but it would take a long time to trap them all. Mr. Crouch thinks they would breed and multiply in the summer faster than you could trap them.

Poisoning is a successful way of getting rid of rabbits, but you MUST BE CAREFUL HOW AND WHERE THE POISON BAIT IS PLACED. IT'S JUST AS POISONOUS TO YOUR FARM ANIMALS AS IT IS TO THE RABBIT. Use poisoned bait in the winter or after long droughts in the summer have made green food scarce. It isunlawful to use poison to destroy rabbits in most States where they are classed as game.

Young trees are subjected to inquiry by cottontail rabbits probably to a larger extent than other crops, and this injury may be stopped by the use of mechanical protection around the trees.

Farmers' Bulletin No. 702-F, entitled "COTTONTAIL RABBITS IN RELATION TO TREES AND FARM CROPS," contains more information on this subject.

According to Mr. Crouch there are rabbits in every State in the Union. Cottontails are more numerous east of the Mississippi. We have already taken a shot at them so let's cross the river at Memphis on that big high bridge, and go West over in the land where both jack rabbits and cottontails occur. Remember that the west side of the river is the big jack rabbit country. Jack rabbits prowl around all night and sleep late the next morning, so they probably took the west side of the river because the sun is an hour or so later getting over in that country.

Now folks, I don't want to discourage you, but you're going to have to do some running if you keep up with jack rabbits. Ira N. Gabrielson, of the United States Biological Survey, got one down in a ditch one day and then got in behind it with his automobile, and the speedometer registered 38 miles an hour before that 20-foot jumper took a siding.

There are several kinds of common rabbits in the East but the cottontail is more common. There are several kinds of jack rabbits in the West, but the black-tailed jack and his cousin the white-tailed jack seem to be more prevalent. This black-tailed jack thrives in the mountain section while the white-tailed jack stays closer to prairies and civilization. The black-tailed jack will be found prosperous and happy far out on scab rock covered with scanty sagebrush. He'll thrive just as well in a rocky section where sheep sharpen their noses so they can get the grass from between the rocks, as another rabbit will down in the valley living on some farmer's grain field, alfalfa crop, or watermelon patch..

Droughts or bad winters don't bother jack rabbits a great deal because they can take a few leaps and be in a new section where food is both handy and plentiful. The fact that they can live on "sagebrush" as one farmer put it, amd change locations so rapidly, makes them hard to handle.

Now, how are we going to get rid of this enemy which slips into the barnyard, and gnaws the bottoms and sides of the haystacks until they turn over, while he is waiting for green crops to be ready to eat in the spring?

Well, one thing is certain. No ordinary dog is going to catch many of these long-eared jumpers, and eagles and hawks can't handle the situation, so man will have to take a hand, because jack rabbits are too numerous and troublesome in some sections of the West. Twelve jack rabbits will eat as much green forage as a 120-pound ewe sheep, and 59 will eat as much as a 750-pound cow.

Rabbit drives, rabbit poison, and rabbit hunts seem to be the general control methods meeting with the greatest success. However, last year the Biological Survey aided in working up a market for the rabbit skins. These brought from 15 to 45 cents each, and this resulted in the sale of more than 8,000,000 skins, bringing about $2,000,000. If a market like this can be retained, the jumping jack will have to look out for their skins. A skin demand at that price will soon solve the jack rabbit problem.

If you want more detailed information about controlling cottontail and jack rabbits write this station for Farmers' Bulletin No. 702-F, "COTTONTAIL RABBITS IN RELATION TO TREES AND FARM CROPS," and Yearbook Separate No.855-Y, "DEATH TO THE RODENTS." For still more information on this subject consult your State College of Agriculture, or write the United States Biological Survey, Washington, D. C.

I've enjoyed having your radio friends with me on this rabbit hunt. Now I'm going to leave you and be gone for two weeks in search of more information about our natural plant and animal life. I'll tell you what I found when I get back. Good bye now for two weeks.

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CLOSING ANNOUNCEMENT: You have just listened to the Wilds Man talk about controlling cottontail and jack rabbits. He mentioned Farmers' Bulletin No. 702-F, "COTTONTAIL RABBITS IN RELATION TO TREES AND FARM CROPS," and Yaarbook Separate No.855-Y, "DEATH TO THE RODENTS." You may have a copy of each of these publications by addressing your request to this station. This is one of the regular Naturalists programs coming to you every two weeks through the cooperation of the United States Department of Agriculture and Station_____.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, March 14, 1930.

NOT FOR PUBLICATION

SPEAKING TIME: 10 Minutes. All Regions.

HOW TO PROTECT YOURSELF FROM SNAKES.

OPENING ANNOUNCEMENT: Today our old friend the WILDS MAN is going to tell us about good snakes, bad snakes, and finally how to protect ourselves from the bad snakes, and wind up by telling us what to do in case we are actually bitten by a poisonous snake. He got this snake information by interviewing Uncle Sam's Naturalists, and these Naturalists programs come to you regularly from this station, every two weeks, through the cooperation of the United States Department of Agriculture. All right Mr. WILDS MAN, bring on the snakes.

--ooOoo--

All right folks, put on your boots, get the garden hoe or anything else that's handy -- because we're going to talk about snakes, and you may want to defend yourself before we get through. When it comes to talking about snakes, I don't have to draw on my imagination, because I've had the 'been there experience'. I was born in the South, where a plentiful supply of stories about black snakes and coach-whips developed many of the children into fast runners, and I'm speaking the truth when I tell you that I was once a fast man when there was a snake of any kind behind me -- and I wasn't by myself either. I have had plenty of company when it came to getting away from a snake.

Snake stories are legion. There have been more mythical stories told about snakes than about all the rest of the animal kingdom combined, including those told about Brother Fox and Peter Rabbit. Now the fairy tales of childhood usually become vague with the passing of years, but this is not always true when it comes to snake stories. The superstitious fear of snakes in general has become so firmly fixed in our minds that it is very frequently impossible to eradicate it. For example:

The coach-whip is a slender, swift-moving, brownish-black snake of the southern and southwestern part of the United States -- and is entirely harmless to man. Yet the coach-whip snake has long been a terror to the colored population of the South, and many weird stories are told of Negroes found dead in the road from being whipped to death by one of these snakes. Now the coach-whip snake has a habit of raising the fore part of the body when traveling -- and if you happen to be in front looking back and see that swift-moving snake moving along with its head about a foot up in the air -- whitefolks, blackfolks, and all other kinds of folks usually kick dust in the snake's face as they follow the first impulse to depart hurriedly for regions unknown.

Over in the dairy section they accuse some snakes of sucking milk cows, and the little undeveloped teats on the cow's udder are sometimes spoken of as snake teats. In order for a snake to close its mouth and create a vacuum around the cow's teat, it would be necessary to sink its teeth or fangs into it, and your radio listeners, whether you live in the country or on the 10th floor of a city apartment, know that no cow is going to stand still while a snake does this. You just try pinching her teat when you are milking and see how quick she kicks you off the milking stool. Now that ought to be sufficient proof that snakes don't suck milk cows, and I'm going to say that the so-called 'milk snake' does not harm man at all.

In another section of the country we have another mythical story about a snake that takes the end of its tail in its mouth and rolls like a hoop, in this position outruns the fastest horse in the country. This account refers to the horn snake which is harmless. This horn snake is bluish-black with a few red bars across the belly, and its tail tapers to a fine point, having the appearance of a horn or spike, but this spike is quite harmless and incapable of stinging anything.

Early one morning I was picking beans near the banks of the Mississippi River. Suddenly I heard a familiar hissing sound right close to my hand, and saw a spreading viper coiled apparently ready to finish me up. In those boyhood days I usually went with half of my jump executed anyway so I finished the jump and landed many feet away from the snake. Now this particular snake is known as the spreading viper, puffing adder, blowing adder, hissing viper, and sand snake, and is actually oneof the greatest bluffers among all snakes. It is harmless, but many superstitious stories are told about its poisonous venom, one of which is that the breath of this snake will kill a person 20 feet away. The snake is not poisonous, however, and its teeth are too short to inflict a wound in case it tried to bite you -- but I didn't know this that morning when I was picking beans and thereby hangs the strong thread of this whole snake talk.

We have listened to stories about snakes, heard the reptiles rattle and hiss, seen them raise their heads in the air and chase something -- and that was enough -- we took it for granted that all snakes were bad, poisonous, dangerous, and to be killed. Such is not the case. Most snakes are beneficial -- helpful to the farmer, and should not be killed without cause. Snakes devour large numbers of insects and mice, many of which are injurious to garden crops and especially to stored grains and foodstuffs.

Kingsnakes used to be considered poisonous. They are not. Kingsnakes are actually able to kill rattlesnakes and have been known to eat them. Now this is a case where one snake sometimes befriends man by helping him kill another that is dangerous.

Chicken-snakes and blacksnakes have been known to steal eggs, and sometimes to eat baby chicks. This is an objectionable habit, of course, but steps can be taken to stop such losses by snake-proofing poultry buildings. These snakes usually feed on mice, rats, young rabbits, and insects.

At the end of this talk I'm going to give you listeners the titles of two free publications listing the poisonous and nonpoisonous snakes, and telling what to do in case you are bitten by one that is poisonous. At this time let's

take up the few poisonous snakes, and if possible get rid of them -- for they are an actual as well as a mental hazard in these days of hiking, camping, and auto picnicking.

Harlequin snakes are poisonous. They often resemble scarlet kingsnakes, and are found from South Carolina across to Arizona and southward to South America. Learn to distinguish between these two snakes and kill only the harlequin; keep and protect the kingsnake.

Pit-vipers occur throughout temperate and tropical America. To this class of poisonous snakes belong rattlesnakes, cotton-mouth water moccasins, and copper heads.

Of course, you must know that there are many different kinds of rattlesnakes. The diamond-back rattler of the South is among the most excitable and most vicious of all the North American pit-vipers. Steer clear of rattlesnakes. Don't take chances around rocky cliffs, or places where these snakes stay. Rattlesnakes are not given to tree climbing, but they do often stay in swamps.

The cotton-mouth water moccasin of the South is vicious, irritable, and pugnacious. This snake is next to the most poisonous snake in our country. The diamond-back rattler takes first place because of its size. Steer clear of these snakes. They may bite immediately when disturbed, and have been known even to attack and bite without provocation.

The copperhead is a very poisonous snake, and frequents rocky places in certain parts of our northwestern States in the vicinity of timber, marshes, and abandoned stone quarries. It is also found in the South on high, dry ground. This snake usually attempts to escape, but is very dangerous when cornered. It is vicious, gives no warning of its presence as does the rattlesnake, and can strike in any direction instantly.

Ordinarily a snake can strike about three-fourths of its length, so keep your distance around one that is poisonous. If bitten by one, bleed the wound, if possible put a ligature between it and the heart, and get to a doctor in the shortest possible time. Antivenin is the name of the serum that is the most successful means of combating the poison of a snake bite.

I got most of the information I have given you from the United States Biological Survey, and this bureau has a world of valuable information that every farmer ought to have so that he can know the difference between poisonous and non-poisonous snakes, and know the actual usefulness of some snakes. I have just touched a few of the high points in the literature this bureau gave me, and I'm going to suggest that you write immediately to the United States Bureau of Biological Survey, Washington, D. C., and ask them to send you the two free leaflets on snakes. Here they are: "FACTS ABOUT SNAKES," and "POISONOUS SNAKES OF THE UNITED STATES."

I have enjoyed talking to you radio people about both the bad and the good snakes, and I sincerely hope that none of you have snake dreams tonight. Good bye now for two weeks, and then I'll reappear with some more information from Uncle Sam's Naturalists.

--ooOoo--

CLOSING ANNOUNCEMENT: You have just listened to the WILD MAN talk about the snakes in this country. He mentioned "FACTS ABOUT SNAKES," and "POISONOUS SNAKE OF THE UNITED STATES." Both of these mimeographed leaflets are free for the asking. Direct your request to this station, or write to the United States Bureau of Bilogical Survey, Washington, D. C. These Naturalists talks come to you at this time from this station every two weeks through the cooperation of the United States Department of Agriculture.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

★ MAR 25 1930 ★
U. S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS

Friday, March 28, 1930

ANNOUNCEMENT: Our Wilds Man is extra wild today. He has been on a visit with Uncle Sam's Naturalists in the Forest Service. He has been going over the records of our forest fires. He has had burned into his mind a few facts about fire which it might be well for all of us to remember ------- Isn't that right, Wilds Man? ***

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We had a big fire in the forests of California in the year two hundred and forty-five.

That is what Mr. C. E. Randall, of the U.S. Forest Service, told me. Then he went on to say that we had another big fire in our forests in fourteen forty-one --- fifty-one years before Columbus landed on this side of the world -------

-----"What there," I said. "Who knows about those fires? We couldn't have any records---------"

"Oh, yes," Mr. Randall insisted, "the records are burnt into the trees themselves. Fire-scars in the big trees of California, in those cases, have given us the dates. It is simply a matter of counting the annual growth rings. Counting the rings from the outside into the scar in the top of a stump or end of a log gives the date.

"In some fires," he went on to explain, "especially ground fires burning the litter on the forest floor, some of the older, more vigorous trees may be damaged only slightly. New growth covers up the damage; leaving only the fire-scars in the wood to tell the tale. Many other trees may be only wounded badly enough to let in insects and rot-producing fungi which further damage or kill the tree. Many other trees may be killed outright by the fire. But tremendous as is such damage from trees killed outright, the wounding of trees and the destruction of the litter which helps feed the forest and reduce floods by checking the run-off is probably equally important.

"I mentioned those ancient fires, just to point out that ever since we have had forests we have had forest fires."

"What caused them back in those days," I asked.

"Lightning or Indians," he replied, "You see there are two chief Fire Demons; Lightning and Careless Man. Lightning is still one of our most important causes of fire. Next to railroads and lightning, however, campers rank first.

Then Mr. Randall reminded me that as a calamity a big forest fire ranks with flood, and pestilence, and famine, and earthquake. We forget most of them. But some fires, because of the lives lost, property destroyed, or large areas burned, have become historic.

For example, there was a big one in Maine and New Brunswick back in 1825 which burned over three million acres and killed one hundred and sixty people. In Wisconsin, there was a fire in 1871 which killed fifteen hundred people and burned over a million two hundred and eight thousand acres. That same year, a forest fire in Michigan burned two million acres of timber land. There was another big one in Michigan in 1891 in which one hundred and thirty-eight people lost their lives. However, a forest fire in Minnesota which burned over a much smaller area cost the lives of four hundred and eighteen people.

You can follow the blackened trail of the Fire Demon in the woods on through the years. You may remember the big fire in Idaho and Montana, in 1910, when two million acres were burned and eighty-five persons lost their lives.

That was the fire in which Forest Ranger Ed Pulaski and 120 men were trapped in the flaming forest. Fifty of the men broke away in a panic but lost their lives in the fiery forest furnace. As the flames swept through the canyon in which they were, Ranger Pulaski managed to herd the rest of his men into an abandoned mine tunnel. He ordered them to lie down on their faces, while he stood at the tunnel mouth and held them in at the point of his gun. Pulaski eyes were injured by the heat and smoke, but he saved his men --- all but five, who were suffocated because they did not obey his orders to keep down.

That is just one of the many stories of heroism by the Forest Rangers of the U. S. Forest Service. Fighting fire is no frolic.

But when Mr. Randall was telling me that story, I got to thinking of the fire protection service with its system of lookouts and communication for spotting fires and giving warning. Also the arrangements for getting men and equipment to the scene of the fire. The Forest Service now uses airplanes in reconnoitering large fires and is experimenting with portable radio sending sets to be carried by fire fighters. The Forest Service is constantly improving its fire protection service. Thoughts about that prompted me to say; "With all your system of fire fighting is the forest fire situation getting better or worse?"

"Both", Mr. Randall replied promptly "The danger of men-caused fire is greater than it used to be, but on the other hand, organized protection is getting more effective all the time." Then he called my attention to the fact that a forest fire in Minnesota in 1918 destroyed a town of 8,000 people, and that fourteen Forest Service men were killed in forest fires just last year. That doesn't count the persons not listed among the fire fighters. Last year nearly a million

acres were burned over and it cost over $3,000,000 to put out the fires on our National forests alone.

Of course, some years are worse fire years than others; drought and other weather conditions are largely responsible for that. But, according to Mr. Randal, the danger from man caused fires is on the increase rather than the decrease.

The increase in automobile tourists and the multiplication of campers has added tremendously to the menace of fire, and there is also the danger of sparks from railroad trains and sawmill operations. Every big fire was a little fire once. Many cases of forest damage have been traced to smouldering cigarette butts or matches carelessly tossed aside or to camp-fires left burning.

Airplanes now threaten to further increase the danger, as experiments have shown that lighted cigars and cigarettes tossed from airplanes often strike the ground still glowing. The Fire Demon has taken wings, but he hasn't flown away. He has merely increased the possibilities for damage. A cigarette dropped from an airplane in a lonely spot might well cause a fire which would sweep away millions of dollars worth of timber before it could be brought under control. Remember, every big fire, every historic holocaust, was a little fire once.

When the Fire Demon sweeps through the tree tops or creeps like a serpent through the litter on the ground, it may seem a terrible thing. But please remember that individual, human carelessness is responsible for a large percentage of our forests fires. Do you have a little Fire Demon under <u>your</u> hat? Does he ride in your car? Does he sit at your camp-fire?

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<u>ANNOUNCEMENT</u>: Our Wilds Man has just called our attention to the need for care to guard against fire while we are in the woods. The Spring is one of our important fire seasons, and this Station ---- is glad to cooperate with the United States Department of Agriculture in again calling attention to this menace.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, April 11, 1930.

ANNOUNCEMENT: Every two weeks at this time our Wilds Man tells us about his visits with Uncle Sam's Naturalists. This time it is about his visit with a Bird Man --- No, no, not an airplane pilot -- but one of those fellows who knows about our feathered friends that flit about the home place these days and fill the air with music; and themselves with bugs---- All right, Mr. Wildsman bring on your birds ------

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I never could go into raptures about the birds. I admire the looks of some of them. I like to hear some of them sing. But when you have had a flock of birds make a raid on your orchard and practically carry off a tree full of fruit, you are apt to be skeptical about the value of birds.

I was until I talked to Mr. W. L. McAtee. Mr. McAtee admitted that sometimes flocks of robins, or starlings, or sparrows do considerable damage to crops. But he says that most birds do much more good than harm. Fact is, he insists that it is worth while having them around. He holds that it actually pays to provide homes for birds and make things attractive for them.

You see, Mr. McAtee has inside information on this subject. He is in charge of the Division of Food Habits Research of the United States Biological Survey. In order to get a good idea of what our birds eat, his division has examined the contents of the stomachs of thousands of birds of all kinds. Mr. McAtee is an authority on bird bills-of-fare.

He estimates that, at the lowest figure, our insect-catching birds, such as the house wren, the blue bird, the purple martin, and others too numerous to mention, keep down insects and insect damage by twenty-five per cent. That is, if it were not for our insect-catching birds, damage to trees, and crops, and pastures by insects would be at least one-fourth more than it is now. When we think of the damage some insects do, we can thank our lucky stars we have the birds.

For we do have the birds. Some folks seem to think that most of our birds disappeared when our forests were felled. Some did. But Mr. McAtee tells me that very many of our small birds are now more numerous than they ever were before. Comparatively few of our birds live in the depths of the forest. They prefer the cleared edges and the mixed growth of the farm woodlot.

And out in the wide open places, armies of insects have literally been swallowed up by armies of birds. In one case, when the grasshopper had become a burden in the land, birds began coming to the farmers' rescue. "First a speck, and then a shadow, until the air was dark with pinions" as the poet would say.

Sixty-six kinds of birds are known to feed on cotton-boll weevils, chief among which are the orioles, which pick the weevils right out of the squares, or cotton flower buds. Then too "when the swallow homeward flies" it is often with a full meal of weevils caught winging their way to new fields.

Every day the birds are busy. Rain-crows, or cuckoos, feed largely on caterpillars. Many birds don't like fuzzy-wuzzy worms. But the rain-crow goes after the hairy and spiny kinds just the same. Then, of course, everybody has heard the woodpecker. His insect eating has always been well advertised. From a third to two-thirds of the food of some species of woodpeckers is made up of wood-boring grubs. One yellow-hammer, or flicker, has been known to eat as many as 5,000 ants at a single meal.

Even the little humming birds we used to think lived only on the nectar of flowers catches many a minute insect on the wing. Then there are the warblers. There are millions of them. And all day long those millions are devouring caterpillars, and scale insects, plant lice, and other insects, which are such a drain on the vitality of trees and bushes.

Mockingbirds, and sometimes even catbirds and thrashers do more harm eating cultivated fruits than they do good in destroying insects. But they can sing. You'll have to admit that. Some folks like to hear them so much they invite them to hang around their homes:

You know the old saying that a bird in the hand is worth two in the bush. Anyway, a useful bird is worth more to you in your bush than he is over in the other end of the county.

The more birds, the bigger drain there is on their food supply. If that food supply is chiefly damaging insects, we win. If that food supply is our crops, we lose. And there is just the trouble with some folks and birds. They are afraid in trying to attract useful, enjoyable birds that they may attract some of these crop-gangsters that do more damage than good.

Mr. McAtee points out, however, that it is better to have more birds. You may be able to get rid of the kinds you don't want if they do show up. But you can't create the good kinds on short notice when you need them. He says that on the average birds are beneficial.

Of course, jays and crows have always had a bad name. But even they do about as much good as they do harm. Where they get too numerous it is sometimes necessary to weed them out. Flocks of blackbirds also in places get too plentiful for the good of our grain. But in the case of the insect-eating birds of our farm woodlots, there is little danger of them getting ahead of their food supply.

One of the best ways to attract attractive useful birds, is to build nest boxes for them. "The time of the singing of the birds is come" and the United States Department of Agriculture has a bulletin on "Homes for Birds." It tells how to build them and where to locate them so that the birds will be most likely to take to them. Write for Farmers' Bulletin No. 1456-F on

"Homes for Birds". There are also several bulletins telling how to attract birds in the different sections of the country; including the middle Atlantic, the northeastern, the east central, and northwestern States. The bulletin covering your section of the country may be had for the asking.

Using birds to help keep down the insect damage seems to some folks a small thing. Yet this system is tremendous when you consider the number of more or less insect-eating birds in these United States and the work they do. It is estimated that there are more than four and a half billions of birds in this country. And as each of these birds may average a hundred or maybe several hundred insects a day ----- well, you will have to get a better mathematician than I am to figure the total, but the help they give us is considerable.

And while they are doing it, they give us flashes of gorgeous plumed beauty or "pour forth strains of unpremeditated art." What would the home-place be on a fresh Spring morning but for the music of the birds -- robbers and all?

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ANNOUNCEMENT: That bulletin mentioned on "Homes for Birds" is Farmers' Bulletin No. 1-4-5-6-F. You can get it by either writing to Station_____ for it, or by writing to the United States Department of Agriculture, at Washington, D. C. Station_____ cooperates with the Department in presenting these chats with Uncle Sam's Naturalists.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, April 25, 1930.

ANNOUNCEMENT: Now is the time alot of folks like to get out in the woods. Others of us like to tinker around the back yard, and maybe build a new chicken coop. But from what our Wilds Man has been telling us Uncle Sam's Naturalists have been telling him about wood and trees,------- but I'll let you tell all that, Mr. Wildsman -- That ought to interest the handy-man-about-the -house as well as the wood rangers ----------

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I guess everybody knows some kinds of wood are stronger than others. And all you men who have worked with wood probably realize that some pieces of wood are stronger than other pieces of the same kind.

For some time the U. S. Forest Service has been testing out timbers for strength and qualities of different sorts; and looking into the reasons for those differences in lumber cut from the same kind of trees from the same woods.

The Forest Service's Office of Experiment Stations, tells me that many of the strength secrets of some trees have not only been found out, but how to handle the forest so as to control the strength of the lumber which can be cut from trees is also known.

It is largely a question of how densely the trees are growing together in the woods; that is, whether they are crowded or spaced far apart.

You have all probably noticed how the trees in a thick woods prune themselves naturally. Where they are spaced close together, the lower limbs are shaded out and killed while the tree is still young. The fungi, snow or wind do the rest; and cause the lower limbs to drop off.

It is important for trees to shed their lower limbs early in life, because then any limb-scars or knots will be left near the center of the tree when it is ready for harvest. The new growth laid on the trunk in rings every year after the lower limbs are dropped will be free from defects. Thus more clear lumber can be cut from such a tree. When the young trees grow far apart, the lower limbs are not shaded off or purned by nature. The lower limbs persist and when the mature tree is cut, the knots are bigger and cause more of the lumber to be of a low grade.

But let's not look at this question altogether through a knot-hole Even the strength of the clear lumber is affected by the spacing of the trees. One clear piece of hickory, or oak, for instance, may be stronger than another piece, because of the surroundings under which the tree grew from which that wood was cut.

At the Forest Service I was shown a cross-section of a tree, such as you can see on the end of a log or the top of a stump in the wood-lot. It was explained to me that this matter of weight and strength in any particular wood is largely a question of the development of the tree rings. These annual growth rings in the tree are formed in two parts; a layer produced in the spring, and the denser tougher layer laid down in the summer. The more wood a hardwood tree can produce in a year, that is, the faster it grows, the stronger the wood is as a whole. This is because the faster it grows the greater the proportion of the stronger wood fibre cells that is formed.

In the case of hardwoods such as ash, and hickory, and walnut and elm and the like, our foresters find that when conditions are unfavorable to growth in the later part of the growing season the proportion of these strong wood cells is less so the wood is lighter and weaker. However, hardwood trees crowded too close together ordinarily do not produce as strong timber as trees further apart. Hickory or oak grown under the crowded conditions of the original virgin forest are therefore not as strong as second-growth hickory or oak.

Yet, as you know, we need to grow the trees close enough together so they will shed their lower limbs. So if we want to grow wood both free from defects and strong, we have to grow the trees with a close spacing while they are young and then thin them out later so they will have room enough to get the nourishment they need to make rapid increases of new growth. Strength in hardwoods goes with a fairly fast but even rate of growth.

In the case of cone-bearing trees, such as the redwoods and southern pines, the spacing has a little different effect. Redwoods and pines grow faster with more open spacing than when crowded; but the open-grown trees produce more of the lighter-weight, weaker spring wood than they do strong summer wood. In conifers, cells different from those of hardwoods make up the bulk of the wood. In order to grow stronger wood, pines and redwoods must be grown fairly close together. The pinesand redwoods producing the stronger wood, don't grow quite as fast as those producing weaker wood. The softwoods having the stronger wood have a goodly proportion of dense summer wood.

As we said, second-growth hickory is stronger than virgin-growth hickory. Second-growth pine, however, is weaker than the wood from pines which originated under the fairly crowded virgin forest.

By wide spacing of trees, we can produce light wood in second-growth southern pines and redwood. The individual trees will have bigger tops, more knots, and will produce less clear lumber; but they will grow to a certain size in a much shorter time.

So you see, by spacing and thinning we can now have quite a say-so as to the quantity and quality of the wood produced in our woods.

Strength in wood is important whether the wood is to be used for airplane wings or floor joists.

But spacing and thinning are not the only way to influence the size of that layer of summer wood in the tree ring. Another help is to keep fires out of the woods. It is said that prevention of forest fires in southern pines would stop the destruction of a lot of forest litter which in rotting would otherwise add nutrients to the soil. Litter also holds moisture. That food and drink should help the trees grow faster.

In their studies, the U. S. foresters have found that trees on good sites keep on producing good, heavy, strong wood in quantity when trees on very poor ground produced much weaker wood and a lesser quantity.

Back in the old days, the main idea was to get the land cleared so we could put it to the plow. We had plenty of all kinds of woods -- and we used them -- How we did use them! --- Nowdays, we are beginning to look at wood as a crop, like any other crop, except that it takes longer for it to mature. We are finding that we must be more careful how we use wood. We are also finding how to grow wood to fit the uses we have for it.

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ANNOUNCEMENT: The program you have just listened to is one of a series of visits with Uncle Sam's Naturalists. One of these talks is presented every other Friday by this Station -------in cooperation with the United States Department of Agriculture.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION
MAY 6 1930
U. S. Dept.

WITH UNCLE SAM'S NATURALISTS. Release Friday, May 9, 1930.

NOT FOR PUBLICATION

ANNOUNCEMENT: Some birds are a delight to have around. Many birds are beneficial. We all admit that. Other birds are not so popular. Many hard things have been said about sparrows, and starlings, and crows. Generally speaking, they are gangsters, and they are so regarded and so treated. Our Wilds Man, however, is going to give us the low down on them -- Well, Mr. Wilds Man? -----

--ooOoo--

Let's start with the Crow. He is a gangster and a robber. No question about that. Some say the heart of a crow is blacker than his feathers. But the crow is not so black as he has been painted.

No. I am not going to try to whitewash the crow. I'll admit he pulls up young corn, eats roasting ears, often feasts on ripe watermelons, and shows too much fondness for little chickens. I'll admit he goes in gangs, and often does heavy damage. If any of the rest of you want to testify against the crow, the line forms on the right.

But before we pass sentence on this gang, there is just one witness I want to call. That is Mr. W. L. McAtee, of the Food Habits Research Division of the United States Biological Survey. We'll just ask him to identify the articles of food found in the stomach of thousands of crows collected in 40 States, the District of Columbia, and several Canadian Provinces.

Then I think your verdict will be that the crows do as much good as they do harm. True they do eat corn, and lots of it. They eat it all months of the year. Even in June, when there is little corn in sight, crows are smart enough to find enough to make up one-fifth of all their food. But crows eat a lot of other things. They get their food off the ground, and another fifth of their diet is made up of insects. For every bushel of corn the crows eat in June, they eat more than two bushels of insects. Young crows do even better than that. During the months of April, May, and June, nestling crows eat four bushels of May beetles, grasshoppers, caterpillars, and other farm pests for every one bushel of corn they consume.

According to this evidence of Mr. McAtee, the crow has been a much persecuted bird. Indiscriminate killing of crows is not warranted by the facts in the case. Where the crows are doing harm preventive measures will often put a stop to the nuisance and allow the crows to continue the good work of keeping down our insect enemies. Many other facts about the crow are given in Farmers' Bulletin No. 1102-F, which has for its title, "The Crow in Relation to Agriculture."

Speaking of nuisances, we can't help being reminded of ENGLISH SPARROWS. They are at some but not at all times a quarrelsome, bunch of bandits and racketeers. Sparrows have been caught destroying the eggs and young and usurping the nesting places of bluebirds, house wrens, purple martins, tree swallows, cliff swallows, and barn swallows. They have destroyed cherries, grapes, pears, and peaches and have killed buds and flowers of cultivated trees, shrubs, and vines. In the garden they often eat seeds as they ripen, and nip off tender young peas and lettuce. They damage wheat and other grains, whether newly sown, ripening, or in shocks. These misdeeds are more in evidence where the bird is a newcomer; but it settles down to a considerable extent where long established.

But sparrows were not ever thus. When they are very young, they too have good food habits. Almost all their diet the first few days of their lives is made up of insects, including some of our chief pests. But that doesn't last long. And after that the Food Habits Research Division has little testimony to offer that is favorable. The United States Department of Agriculture has a bulletin called "The English Sparrow as a Pest." It is Farmers' Bulletin No. 493-F. It tells how to kill sparrows and how to trap them where they have become a nuisance. One good thing you can say for English Sparrows is that there are apparently not so many of them as there used to be, especially in eastern States.

That is not the case with that other immigrant known as the European Starling. Starlings are spreading, gradually but surely. In many parts of the East there are now more starlings than there are sparrows. And there are some of them found from Maine to beyond the Mississippi River and from southern Canada to the Gulf of Mexico.

The scarcity of nesting sites in the Great Plains may check their spread. The Rocky Mountains will also probably serve as a barrier for a time. But eventually they may range from coast to coast.

Starlings were introduced into this country just forty years ago. For six years, they seem to have stayed in New York City. Since then they have continued to multiply and spread more or less steadily.

Starlings may raise two or three broods of three to six young a year. The increasing numbers forces them to reach out farther and farther for food and nesting places. These birds, that "look like blackbirds that have lost their tails" and fly in vast flocks, have not yet developed in this country the destructive food habits said to characterize them in some parts of Europe and in Australia. The Food Research Division of the Biological Survey has found that starlings, judged by food habits only, are not bad citizens. They seem to do more good than harm through their feeding on insects.

But they too are gangsters. During fall and winter they do fly in big flocks, and at that time they seem to prefer to roost where they are least wanted. They have been observed to attack and drive off such birds as the bluebird and the flicker, but the latter sometimes evens the score. It is still an open question whether they will eventually cause a decrease in the total number of our native birds. Conflict between the species can be reduced by providing plenty

of nest boxes for all. One thing seems probable, however, and that is that for a time they will drive many of our native birds away from about our houses. They do damage to cherries and other small fruits, and to garden truck and even late fruit and corn.

Against such damage we should weigh the evidence that they destroy such pests as the clover-leaf weevil, the Japanese beetle, May beetles, cutworms, and grasshoppers, even more energetically than some of our native birds.

Where the flocks of roosting starlings gather about homes and business houses in cities, however, they are an unmitigated nuisance beyond the shadow of a reasonable doubt. In such cases, the Department of Agriculture experts advocate local control measures. These, along with many other facts about the starling, are presented in a bulletin known as the "European Starling in the United States", Farmers' Bulletin No. 1571-F.

--ooOoo--

ANNOUNCEMENT: Did you get that number? "The European Starling in the United States" is Farmers' Bulletin No. 1571-F. The English Sparrow as a Pest" is Farmers' Bulletin No. 493-F, and "The Crow in its Relation to Agriculture" is Farmers' Bulletin No. 1102-F. To get any of these bulletins, just write to this Station_____ or direct to the United States Department of Agriculture at Washington, D. C., with which this Station cooperates in presenting these talks.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

U. S. Department of Agriculture

CHATS WITH THE WEATHER MAN

Friday, May 16, 1930.

ANNOUNCEMENT: This is our day for a chat with the weather man. Old Ob. Server is here to tell us what he has picked up from the scientists of the U. S. Weather Bureau.-----Tell us about it, Mr. OB. Server. We always have weather, Good or bad, we have it morning, noon, and night. We have it from dark to dawn and from sunup to sunset ----------

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Speaking of sunsets, did you see that wonder the other day? It was glorious!! As the colors faded out in the sky, I thought of the words of the poet:

"What magic shall solve us the secret
Of beauty that's born for an hour?"

But that was nothing to some of those sunsets we had in 1912. Maybe you remember them, too. The sunset colors were extra brilliant then. The usual faint second glow came back bright. It seemed as if some giant master artist had painted the western sky in a flaming burst of wild genius.

And from what Dr. Herbert H. Kimball, the sunlight expert of the U. S. Weather Bureau, tells me, that isn't so far from the truth. A giant did help paint those pictures. Those extra bright sunsets all over the world at that time were caused by smoke and ashes thrown into the upper air by the Katmai volcano in Alaska, in its gigantic explosion that year.

Back in August 1883 there was a still more violent volcanic explosion of the famous Krakatoa in the East Indies. The ashes from that big blow-up spread around the world and hung in the upper air for more than two years, causing remarkable red sunsets during '83, '84, and '85. When Mt. Pelee in the West Indies erupted in 1902 people in distant parts of the world were again treated to a series of more striking sunsets. In fact, such things seem to happen about once every ten years. It has been eighteen years now since the sunsets of 1912. Dr. Kimball says that this is the longest clear spell we've had since we began to record intensity of the visible and invisible rays we get from the sun.

You see those tremendous volcanic explosions do more than merely tinge our sunsets with extra beauty. Records of the measurements made in this country, and in England, France, Russia, Switzerland, Poland, India, and other parts of the world, show that following the big volcanic eruptions of Krakatoa, Pelee, and Katmai, there was a big drop in the amount of total radiation we got from the sun. The amount of light, heat, and health-giving rays was cut down by the practically invisible screen of volcanic ashes hanging in the upper air. Dr. Kimball, who worked out the figures which showed this remarkable shutting down of our sun-supplies, says that the average person hardly noticed

the difference. To the untrained eye, the sky just looked a little whiter.

As he explains it, what happens is that these tremendous volcanic explosions hurl very fine ashes fifty miles or more above the earth. Far above the highest clouds and above the storms these billions of very light glassy particles of microscopic size settle very, very slowly. They hang as a fog in the upper air. This excess of very fine particles in the upper air increases the intensity of the sunset colors.

Too much dust in the lower air, however, cuts down the brightness of sunsets, and even blots them out. The smoke and dust particles down here near earth don't stay up as long as the very light volcanic ash particles of the upper air. Once about every ten years we get that pronounced fogging of the upper air. Every day we get those bigger particles thrown from our chimneys into the lower air. That dust and smoke nearer earth here also cuts off from us some of the sun's rays, including the invisible ultra-violet rays doctors tell us are so important for our health.

Dr. Kimball and his division of the U. S. Weather Bureau are now measuring the sun's rays of all kinds as they filter through our city smoke. From measurements already made, it is clear that this smoke screen blocks out much of sunlight, and other rays, especially the ultra-violet. In the winter time, Chicago gets little more than half the amount of radiation received at Madison, Wisconsin, a short distance to the north. Even in the summer months, fifteen per cent less radiation filters through the Chicago air than reaches the earth at Madison.

All this time we've been talking about all the sun's rays, those you can see and those you can't. Most of us talking about the sun's rays think of those you can see, those we call "light". Dr. Kimball and his men have made important studies in that narrower range of wave-lengths.

"What size windows should we have? How many windows does a school-room need? Just how much light can we get in north windows, in east or west or south windows from the sky alone? Architects and illuminating engineers now have tables to readily determine those things. They got them from the calculations made from the sunlight and skylight measurements of the U. S. Weather Bureau. That is just another one of those services credited to our weather experts.

We get a great deal of light from an average cloudy sky. But we get nearly four times as much light from the sun and sky combined when there are no clouds, and when it rains, the light is only about half as strong as it is from a cloudy sky from which no rain is falling.

Moisture in the air even on a clear day seems to have a decided effect on the amount of ultra-violet radiation which reaches us. But the ultra-violet rays in sunlight increase fast the higher we get above sea-level. The water-vapor in the lower air layers seems to screen out much of that health-promoting part of the sunshine. It is on high mountains that we get the greatest effect from the ultra-violet, Dr. Kimball's measurements show.

So you see, whether the question is one involving the smoke from our city chimneys, or one having to do with the proper lighting of our homes, and offices, and factories, and workshops and public buildings, we have been helped toward a solution by the Solar Radiation Investigations of the U.S. Weather Bureau. Yes, even if it is a question of where to go for a vacation, we may get some light from such studies. These measurements of the amount and kind and quality of the light are going on all the time. Much is yet to be learned.

As we were saying awhile ago, a little extra brilliance in a sunset may be due to causes which reach around the world and for many miles into the alternated upper layers of the atmosphere.

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ANNOUNCEMENT: Be sure to be back two weeks from today, Mr. Ob. Server! We want another chat with the weather man at that time. ----- As our regular audience knows, this feature is presented by Station ----- in cooperation with the United States Department of Agriculture.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, May 23, 1930.

ANNOUNCEMENT: We've caought our Wilds Man again! --Between trips to the woods and visits with Uncle Sam's Naturalists, he is pretty busy these outdoor days. But he is not too busy to get back to us every two weeks to talk about the forest and the things in it. Today he says he is going to tell us about those wild folk known as motorists, and hikers, and campers, and picknickers.

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Mr. L. F. Kneipp, in charge of the lands branch of the U. S. Forest Service, tells me his work recently took him on horseback into one of the most remote, inaccessible wild areas in any part of this country. It was in the primaeval depths of the Olympia National Forest "where highways never ran." But who should he meet but Boy Scouts hiking through those backwoods. And he passed not one group -- but four or five different groups.

That is typical of what is going on in many of our National Forests. The hardy, more daring campers are making a more or less systematic invasion of the back-woods areas. And when you get nearer in to the more easily-reached sections of the woods the numbers of Nature lovers become thicker and thicker. Swarms of hunters, fishermen, campers, hikers and motorists, head for our vast National Forests scattered through twenty-nine States.

Mr. Kneipp says that last year there were nearly two million campers in our Forests. In addition, there were nearly one million eight hundred thousand guests, stopping at the hotels and resorts in or just outside the Forest boundries, while summer home permittees and their guests numbered three hundred and seventy seven thousand. More than three million people picknicked in our National woods, and over twenty-four million motorists were recorded as "just passing through."

To take care of the crowds, the Forest Service has prepared 1,500 public camp grounds each able to accomodate from twenty-five to several hundred cars of people. At the Eagle Creek Camp Ground in the Columbia Gorge fifty miles east of Portland, Oregon, in the Mr. Hood National Forest, there were one hundred thousand people last year.

That is just the largest. Hardly any center of population East or West but has a National Forest within comparatively easy reach, and camp grounds have become so popular that on many of them the stay of campers is limited to give the other fellow a chance to enjoy the fishing, and hunting, and wading, and swimming, and communing with Nature generally on her own home site.

And speaking of home-sites, the Forest Service has issued more than ten thousand special permits for summer homes in the woods, and over one thousand

permits for summer camps, resorts and hotels.

You might think this big invasion of our last virgin forest areas would make foresters wild. And so it does. Some of them. Mr. Kneipp, however, points out that while our National Forests were originally set aside for conservation of our timber supply and protection of the watershed, they help in large measure to supply our people with recreation facilities. In this day and time, we need places where we can "get out under the open sky, and list to Nature's teachings". Recreation in itstruest sense is to be found in the forests. But when folks flock into the wildwood, of course, there is more danger of fire and more of a menace to health. Any tourist or hunter or fisherman or camper or picknicker who carelessly drops a lighted match or a smouldering cigarette butt or who fails to put out the campfire properly may start a fire which will destroy millions of dollars worth of timber and maybe doom others to death in the smoke and flames.

However, our modern pioneers on our recreation frontier are getting woods wise. They break their matches before they throw them away. They are always sure the match is out and the cigarette stub dead and they never throw them into brush or leaves or needles.

When they go to build a camp fire, they scrape everything inflammable from a spot five feet in diameter. Then they dig a hole in the center of that cleared spot in which to build the fire. They practice the caution of the old-time hunter. They keep the fire small, and never build it against trees or logs or near brush. And when they break camp, they are always sure the fire is dead out.

So as to be sure, they stir the coals and soak them with water. Turn the little sticks and drench both sides of them. Wet the ground around the fire. If they can't get water, they stir in earth and tread it down until it is packed tight around the fire. They know that the last, single spark may be the dangerous one. They kill off that spark. They have begun to realize that these are our camp-site in our forests. It is up to us to protect them.

Man is a social animal. Even in the wilds, he likes company. Our early frontiersmen most often traveled in parties. When they camped or built their cabins they generally tried to get near others of their kind. That is the way it is with those on our recreation frontier, Mr. Kneipp says. They like company in getting back-to-nature.

That very human instinct is a big help to the Forest Service in saving the forests from its friends. Forest officials have encouraged that tendency as one of the best ways to keep down the menace to property and health created by so many folks taking to the woods.

They have established camp-sites and improved them with such sanitary facilities as trash baskets, and garbage cans, and the like. Where the fire-menace is great, they have built in fire places to reduce the hazard. In some back-woods sections where forest rovers are in danger of meeting heavy storms, they have built log lean-to shelters. In that way, they are getting a voluntary concentration of vacationists either on the least dangerous areas of the forest or where government forest rangers can keep better check on the fire and health menace.

Except during dangerous dire weather, there are no restrictions on the visitors to National Forests. On many forests, however, it is necessary first to get a permit to build camping fires. The hunting and fishing is controlled by the State game laws in the different States in which the National Forests are located. In some sections of these big backwoods of ours, anyone going in is required to carry an ax and a shovel — highly important tools for fighting fire. The National Forests, Mr. Kneipp says, are ours to use and enjoy, but not to abuse.

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ANNOUNCEMENT: Anyone interested in the recreational facilities of the National Forests in any section of this country, can get such information either through this Station_____or by applying direct to the United States Forest Service, at Washington, D. C. The Forest Service is part of the United States Department of Agriculture with which this Station cooperates in presenting these talks "With Uncle Sam's Naturalists."

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

JUN

WITH UNCLE SAM'S NATURALISTS. Friday, June 6, 1930.

ANNOUNCEMENT: Our Wilds Man is with us again. He has been out gunning for facts about game birds, and the prospects of keeping up our game supply by introducing new game birds from other countries. Naturally, he went to Uncle Sam's Naturalists in the United States Department of Agriculture to do his hunting. What's in the bag, Mr. Wilds Man?.

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Nearly every hunter has heard about the success of the introduction of ring-necked pheasants and Hungarian patridges in the Northwest. Fewer folks realize how amazingly those birds have thrived in certain other sections.

Now ring-necked pheasants are found over the Northern States almost without a break from coast to coast. The Hungarian patridges have also shown that same ability to occupy and hold territory, and to increase in numbers. Fact is, they have outdone our own birds on their own ground. With an equal chance to respond to feeding and legal protection, our native birds have failed to make good, compared to those foreign birds. And that in spite of the fact they were already on the ground and adapted to the country and the climate.

Why this should be has been a puzzle to me. I consulted an expert on it. Mr. W. L. McAtee, of the United States Biological Survey, gave me a mighty interesting explanation of this strange case of Naturalized versus Native Birds. He points out that Old World birds and animals in their home land have lived in close contact with man for centuries. Similar game in this country with untold millions of acres to range over, have "faded away before the hunters like mist before the morning sun." as Mr. McAtee puts it.

He holds that the differences are largely due to the differences in the hunting. Our native American birds and animals have been hunted by more and better-armed hunters than were the wild stock of the Old World.

Our people came on the American scene fully armed. Hunting was free for all. And they hunted. Almost before our game birds and animals knew what was happening, they had been hunted to the verge of extinction.

Across the water, the game had a better chance. In the Old World, the number of hunters and firearms has always been restricted.

But, as Mr. McAtee says, that doesn't explain it altogether, because those fewer hunters have usually taken bigger bags. In the Old World, snaring, trapping and other methods of getting game have been practiced for ages. But the birds and animals had time through the centuries to adapt themselves and adjust themselves against the slow improvements in the methods of hunting. They also had a better chance to get used to the changes resulting from increased human population.

In America, our game was adapted to conditions in a sparsely populated country where the hunters were armed with primitive weapons. Then, suddenly they had to face well-armed hunters and a fast growing population. The changes came too fast for them.

Whether or not that is the true reason, Mr. McAtee says there is little doubt that wild life of the Old World, in general, has shown greater ability than that of the New to survive in thickly populated country.

For that reason, he thinks we might well bring in more foreign birds to keep up our supply of game. Of course, he says, where there are plenty of native game birds there is no need to bring in others from abroad. But where the native birds don't supply the demand, there are a number of foreign game birds that may be better adapted to our modern conditions in America than our own native birds.

In places where the ring-necked pheasant has become well-established, it has settled just between the ruffed grouse, which lives in the woods, and the bobwhite, which loves to be near the cultivated fields. The pheasant prefers shrubby pastures, brushy gullies, and marshy lands. It hardly comes into competition with the ruffed grouse and bobwhite at all. The Hungarian partridge on the other hand, favors the same local surroundings as does our own bobwhite. But the Hungarian partridge occupied that sort of land in a range farther north than the bobwhite can stand the winters.

So you see, even in sections where there is a high degree of cultivation, there may be space for new foreign game birds that will add to our total supply of game without interfering much with our own native birds.

Mr. McAtee thinks that in some regions we might add such game birds as the Japanese pheasant, some of the African guinea fowls, the Indian peafowl, and the red-legged partridges which range from northern Africa and southern Europe into Asia as far as India.

He says that the birds that man has most successfully exploited have been hardy, wide ranging kinds. The ring-necked pheasant is one of a number of closely related pheasants ranging from Asia Minor to Japan and Java. And the so-called Hungarian partridge is practically the same as the partridges that occupy ranges extending from the British Isles to Siberia and India. They have shown their ability to stand a wide variety of surroundings and climates.

In looking around the world for new game birds to add to those we already have, Mr. McAtee takes into consideration the latitude, the temperature, and the rainfall of the countries where the birds are native compared to the same conditions here. He says that if the rainfall and temperature of a desirable game bird's native home can be fairly well matched, it is safe to assume that other things can be adjusted so that bird can be naturalized.

The trouble has been that a lot of folks who have tried to introduce game birds here in the past have often failed to go about this thing in a well-planned way. Before we bring in any game bird from abroad we should investigate it in its native home. We should make sure it is a game bird we want. We should look carefully into the question of whether it is adapted to the particular section of our country where we plan to plant it. And be sure that there is a suitable place for it in this country.

Introducing new game birds in this country takes money and hard work. Mr. McAtee says, however, that above all, it takes wisdom, foresight, and good

judgment, if it is to be successful. He describes game birds suitable for naturalizing in the United States in Circular No. 96 issued by the United States Department of Agriculture.

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ANNOUNCEMENT: That circular the Wilds Man just mentioned can be had by writing to the Superintendent of Documents at Washington, D. C. Ask for the circular on game birds suitable for naturalizing in the United States. It is Circular No. 96, and sells for 10 cents.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

U. S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS. Friday, June 20, 1930.

ANNOUNCEMENT: Any of you who have ever been in the woods know there are insects in there. Today our Wildsman is going to tell us something about them. He has been to Uncle Sam's Naturalists. As the saying goes, they've put a bug in his ear. He is not going to keep what they told him to himself, however. He's promised to tell us -------- All right, Mr. Wildsman? -------

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Let's lose ourselves in the woods a few minutes.

As the poet says: "Whether we look, or whether we listen; we hear life murmur, and see it glisten."

Here are big trees, and little ones. The birds twitter in the heavy canopy of leaves above us. At our feet, a young seedling seems to be getting a good start toward one day being a tree. Over there is a fallen stem of a once mighty monarch of the forest.

Trees have their troubles. Dr. F. C. Craighead, in charge of the Forest Insect Division of the U. S. Department of Agriculture, tells me that at no stage in a tree's growth is it entirely free from insect enemies. There are insects which attack it only in the seed. Others in the seedling stage. Still other insects attack only young trees. Others come on when the tree is mature, and help Nature make way for the new growth.

Some attack the foliage. Others burrow into the bark. Others bore into the stem. One insect lays its egg in the terminal buds of a birch tree. The grubs mine their way downward and in a few weeks make channels all the way from the top to the roots. Those channels make the birch pitch flecks which lower the grade of lumber cut from such a damaged tree.

You see, many of our woods insects are specialists. Different kinds attack different kinds of trees. But all the insects in the forests are not bad for the trees. Some are good. By destroying the damaging insects they act as the friends of our forests. Some are parasites which help by attacking destructive insects from the inside. Others aid by eating up the trees' insect enemies.

That is one of the main reasons, Dr. Craighead tells me, that insect damage is not so heavy at all times. Like a lot of our human troubles, forest insects often come in seemingly sudden outbreaks or epidemics or plagues. When they get so plentiful, the good insects which feed on them begin to prosper and multiply too. Then, it generally happens, the good ones become so thick that they begin to thin out the numbers of the forest enemies. That means less food for them. Having cut off their own food supply, the good insects die off in large numbers. That gives the few

forest enemies left another chance, and they begin to increase. Then we have another period of heavy damage in the forest.

Such outbreaks have probably been happening from time to time since there were any woods. We have the record of bark-beetle outbreak, engraved inside a giant tree; and accurately dated, by the tree-rings, as having taken place four hundred years ago.

Nor is all the evidence of past outbreaks confined to such insects as bark-beetles which directly damage the stem of the tree by boring into it. Even the insects which feed on the leaves, Dr. Craighead says, leave a permanent record in the tree-rings of the trunk. Severe destruction of the top by certain insects causes a marked reduction in the width of the annual layers of growth put on by the tree. Dr. Craighead says that the later rings through the entire stem are narrower for several years. Then, if the tree recovers, normal growth rings begin to be formed. So typical are the patterns formed by the tree rings that they can be definitely distinguished from all other known causes of retardation of growth. For instance, a 200 year old spruce examined by Dr. Craighead showed there had been an outbreak of spruce bud worms beginning in 1807 and another unusually severe outbreak of that insect in 1913.

Such records prove that insect damage goes on even in the wild, untouched, virgin forest. In many cases, since man has gone into the forest to cut wood he has upset the natural scheme of things in such a way as to help the forests' insect enemies.

For example, the original forests of our Northwest were a mixture of white pine, spruce, and fir. Along came the lumberman interested at first in white pine. A little later, he took the finer spruce. All the gaps made by taking out the white pine and spruce were filled up by fir. That made things better for the spruce bud worm. The spruce bud worm can only become abundant when there is plenty of fir for it to breed on. When the fir came in where the white pine and spruce had been cut out, the bud worm which destroys both spruce and fir, multiplied fast and spread easily. Twenty-five years' pulpwood supply was destroyed in that region one year.

Another illustration of how man has helped insects destroy woods is the cause of the turpentine borer and the turpentine industry of the South. The turpentine borer tunnels into the turpentine pines and weakens the wood, so that the stems break over in the wind. But the turpentine borer has to have an opening into the tree. It will not attack through the bark. In fact, Dr. Craighead says that the turpentine borer used to be classed as a rare species of insects.

Then came man in his greed to get the biggest return in the shortest possible time. In the Gulf States, South Carolina, and Georgia, a very destructive system of blazing or chipping the pines to get turpentine was practiced. That is, it became customary to cut such wide faces, that the scars left didn't heal over promptly. That was an opportunity for that rare insect. The borers could get in. Pretty soon the turpentine borer

ceased to be rare. It began to increase its damage so much that the turpentine industry was threatened. To save the business, turpentine producers have been forced to make narrower cuts in tapping for turpentine so as to give the borers less chance to get beneath the bark.

A somewhat different case is that of bark beetles in the West. Bark beetles are one of Nature's aids in making away with the mature trees. In our western forests we have over-mature timber which man wants to protect and keep until it can be utilized.

To do that, we must fight bark beetles constantly. Bark beetles each year kill off 18 to 20 million dollars worth of our timber.

On the other hand, efforts to introduce trees in the sand-hill region of Nebraska where there were no trees have brought a string of troubles and a continuous fight with one insect after another. Dr. Craighead says that in trying to grow trees on areas not well suited to trees we cut out for ourselves a tough job.

One of the ways to practice forestry is to follow nature's way of growing trees. Grow the same sort, in the same mixtures, and under the same conditions as nature grows them. Bureau of Entomology specialists are now working with U.S. Forest Service experts in finding out how nature does it.

You see, insects are a very important part of that manner of living we call a forest.

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ANNOUNCEMENT: Our Wildsman will be back two weeks from today. This feature, which we call "With Uncle Sam's Naturalists" is presented by Station ------ in cooperation with the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, July 4, 1930.

ANNOUNCEMENT: This is the day we celebrate! This is also the day our Wildsman tells us about his visits with Uncle Sam's Naturalists. Getting out in the wilds may have something to do with Independence. But it is not very clear that it has anything to do with fire works and Fourth of July oratory. However, our Wildsman says he has a real Fourth-of-July talk for us-----All right, Mr. Wildsman, let the eagle scream----------

*****

Why not let the eagle scream?

He is our national bird, isn't he? The fathers of our country elevated our American bald eagle to that position on June 20, 1782.

It didn't take much of a boost either. As an elevator, old Baldy has a wonderful lift. His preeminence among birds was unquestioned even before the forefathers took action.

Some folks seem to think that the only eagles left are those that fly across our quarters and other small coins and roost on our gold pieces. But there are still some of them in the wild right around our National Capital. Dr. H. C. Oberholser says he was down the Potomac River below Washington the other day and saw four or five bald eagles. He says he can't see that there has been any big decrease in them in most places. There are still thousands of them in all along our coasts. And Dr. Oberholser knows his eagles. He is one of the leading bird investigators of the Bureau of Biological Survey.

American bald eagles are found pretty generally all over North America. As a rule, however, they are most common near the coast. That is, within about a hundred miles of the coast and up the big rivers and near the Great Lakes. There are some American eagles also in the Mississippi Valley. Many of them still live along our Atlantic Coast. There are more yet on the Pacific side. They are most plentiful in Alaska and Florida. Climate doesn't make much difference to a bald eagle, but he does like fish. Old Baldy wouldn't care if every day were Friday.

That fondness for fish, Dr. Oberholser tells me has caused these national birds to be very unpopular with salmon canners in Alaska. The eagles sometimes beat the fishermen to the fish. Most of the salmon they eat, however, are those that die upstream after spawning. Yes, our proud old bird of prey is sometimes quite a scavenger.

In fact, ever since Benjamin Franklin first tried to have the wild turkey made our national bird instead of the eagle, there have been a lot

of hard things said about the feeding habits of American eagles. Art lovers can rest assured, however, that the bald eagles are not so bad as they are sometimes painted.

Dr. Oberholser says that on the whole eagles do more good than they do harm. The fact that they are sometimes scavengers should not be held against them. That they are very useful to man in this way is really a point in their favor.

But the American bald eagle seems to prefer his food fresh. This bird of prey is the wild son of the wilds. He must get his living by beak and talons, as others of his kind do. He generally goes after it himself. However, he is not above acting as an aerial hi-jacker. He often lets the Osprey catch fish and then swoops down on the Osprey and forces him to let go his catch.

Old Baldy even works a similar game with human duck hunters. When the gunner brings down a duck, the eagle may drop like a bolt from the blue and carry it off before the sportsman can get to it.

But the bald eagle doesn't have to have help in getting his ducks, usually catching them when they have dived to escape. The eagle waits until the duck comes up, then swoops again. He keeps that up, until the duck, tired out, falls an easy prey.

Besides having speed as a flyer, Dr. Oberholser says that the eagle can soar as well as the turkey buzzard. There is hardly any greater compliment on soaring ability than that.

In addition, this charter member of our air service is remarkable at zooming. He can shoot down from far aloft so fast that you can hardly see him.

When he comes up again he may be lifting considerable weight. An American eagle has been known to carry a lamb weighing almost as much as itself as far as five miles.

Yes, he does sometimes attack domestic livestock, usually lambs or young pigs. But his chief food is fish. Upland game birds are seldom bothered. He doesn't trouble song birds. He does kill squirrels, rabbits, and rats. He has been known to attack human beings.

That's very seldom. He rarely does it unless provoked to it. Dr. Oberholser points out that when not molested, our American eagle is surprisingly tame and unsuspicious. When it comes to the matter of defending the nest, however, he shows considerable courage.

That nest is quite a remarkable home, and the bald eagle is considerable of a home-body. When eagles mate, they apparently mate for life. They usually build their nest high in the top of a tall tree. If no suitable tree is handy, they ordinarily build on a high cliff or bluff.

The nest is usually a wonderfully strong, substantial structure wherever they build it, and it is quite sizable. About five feet across, and maybe six feet deep, and so strong that a man can walk on it without breaking through. Sticks two or three inches thick are used. Such a huge nest high in the top of the tallest pine may often be seen for miles.

Both parent birds take shifts in hatching the eggs and taking care of the young. There were equal rights in the eagle's aerie long before the 19th Amendment.

The families in these sky-scraper apartments are usually small. There are generally two, sometimes three, eggs. The eaglets stay in the nest for three or four months after they are hatched. When young they don't have those white feathers on the head which give that bald appearance. The older birds are the bald ones.

Old Baldy, or Old Glory, or whatever you call this typical American, has no competitor in the air and no enemies, except man.

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ANNOUNCEMENT: Our Wildsman has just been telling us about the American Bald Eagle in his native haunts. This is one of our bi-weekly series with Uncle Sam's Naturalists. This feature is presented by Station_____ in cooperation with the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Release Friday, July 18,1930.

NOT FOR PUBLICATION

SPEAKING TIME: 10 Minutes.

ANNOUNCEMENT: Our Wilds Man has been on his usual visit to Uncle Sam's Naturalists. Now he is going to tell us what they told him, about some of the life in the woods. You know, there is more to a woods than trees. For instance, there are the other plants, which get their living off the trees ---- All right, Mr. Wilds Man, pull up a toad stool. Sit down, and tell us about some of those things ---

--ooOoo--

Let's get right into the heart of the woods. Before we have gone far, we may even be at the very heart of one of those fine old trees.

You've all seen those picturesque bracket fungi which sometimes grow on the side of trees. You have also seen toad stools around the roots.

Well, Dr. Carl Hartley tells me that those brackets, and toad-stools, and some of their kin with which most folks are not so familiar, cause a rotting at the heart of the tree. Dr. Hartley is a specialist in forest pathology of the United States Department of Agriculture, and he estimates that from the standpoint of timber production heart rots are the most serious of all the diseases of our native forest trees.

Of course, you understand, it is not the bracket or the toad-stool itself which does the damage. The active rot-producers are tiny single threads which grow into the heart-wood and get their food from it. Those tiny threads are the growing parts of the various fungi. And, Dr. Hartley says, nearly all known diseases of forest trees are due to fungi of one sort or another. All the fungi seem to be degenerate forms of plant life closely kin to the plants which form the green scum on ponds.

The toad-stools and brackets and the like are the fruit-bodies of the fungi. They produce the spores, or seed, as it were, by which the rot-causing fungi are spread from one tree to another by the wind or other agent.

A toad-stool is not frog-furniture but really a spore-factory. Those so-called gills or ribs or pores on the underside of the toad-stool are just a means of increasing the spore surface. The more spores the better the chance for the fungi to spread.

The spores which ride the wind from the toad-stool or bracket fungi won't all start trouble in a tree. They must have an opening already made for them to get in before they can start sending those strength sapping threads into the heart wood of the tree. They can only enter some sort of wound.

The butt rots of hardwood trees in the East, Dr. Hartley says, are largely traceable to forest fires. The fires leave the open scars which give the fungous spores a chance to get in. He thinks that if we could keep fire out of our forests we could prevent a large proportion of the butt rot in hardwoods. That would be a well worth-while accomplishment. He estimates that butt rot causes the destruction of approximately one-sixth of the merchantable volume of our hardwoods.

Those butt rots are not one disease, but may be causedby toad-stool spores in one case, bracket fungi spores in another, or some other lesser known fungi in still another. When you figure that there are about one hundred and eighty species of forest trees in this country and that each kind may have several diseases, you see what a job these forest pathologists have. Of course, one kind of fungus may attack a number of different kinds of trees. In some cases, however, it seems that there are different strains of the same kind of fungus and some of the strains are better adapted to one kind of a tree than to another.

In the case of the firs and pines, the most serious disease-causing fungi enter through the branch stubs. Normally, the branches in a thick stand of pine are shaded out, and drop off or break off, leaving an opening into the heart-wood for the fungi.

But those parasites which tap the heart of the tree and flourish in degenerate prosperity by destroying the wood it has produced, are not the only tree parasites. There are also flowering plants, which have taken up this manner of living on the tree.

The best known of all tree parasites is probably our common mistletoe, which clings to the oak and other trees. This well known mistletoe, Dr. Hartley says, is comparatively harmless. It has leaves and manufactures part of its own food. All through the West, except in the wetter regions, however, there are lesser-known, but more definitely parasitic, mistletoes which attack pine and fir and cause a big reduction in lumber quality and quantity. These are likewise flowering plants, but have no leaves.

Dr. Hartley tells me that on a badly infested Douglas fir he has had to hunt for fifteen minutes to find enough of the western fir mistletoe to show to a lumberman. That was because the plant is so completely parasitic that the vegetative parts are all down in the bark, below the surface where they can't be seen. The parts which produce the berries are very small and very scattered.

This mistletoe takes its food altogether from the tree on which it lives. In doing so, it causes the tree to grow in distorted shapes, cuts down the tree's rate of growth, and finally kills it. As a result, there is not only less lumber obtained from the tree than there otherwise would be, but sections of the tree have twisted grain which makes them unfit for lumber.

The losses from these parasitic, western mistletoes are very heavy. As far as is known, it does not occur in the eastern part of the country. Experiments have shown, Dr. Hartley says, that the pine mistletoe might well be able to cause damage to Eastern pines.

That is why, he points out, it is very unwise to ship pines from the West to the East. The practically treeless belt through the Great Plains regions has apparently served as a natural barrier to the eastward spread of the western pine mistletoe. Shipping across may defeat nature's quarantine.

Some of our worst tree diseases have been those brought in from other sections and other countries. The highly destructive chestnut blight and the white pine blister rust are fungus diseases which have been brought in from abroad. Diseases of this type are caused by fungi that kill the bark and girdle the tree! Most of them are so small that even their fruiting bodies can only be seen with the aid of a microscope.

The chestnut blight was introduced from Asia years ago, before the plant quarantine law was passed. But even with the most careful inspection and regulation, Dr. Hartley fears that with increased amount of transportation of living plants and woods, we are going to get in additional forest diseases from abroad. The one hope he sees is in the cooperation of us all in preventing the shipment of nursery stock from abroad to prevent new diseases getting in, which may prove tremendously destructive to our forest resources.

You see toadstools and many, many of their tiny cousins, too small to be noticed, strike at the very heart and roots of our timber supply. The fungi may be small, and the injury apparently slight at any one time, but in the long life of a tree the total damage is often very heavy indeed.

--ooOoo--

ANNOUNCEMENT: Station_____ cooperates with the United States Department of Agriculture in presenting the talks such as you have just listened to. This series called "With Uncle Sam's Naturalists" is part of our program every other Friday.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. Friday, August 1, 1930.

ANNOUNCEMENT: Every two weeks at this time, our Wilds Man tells us about his visits with Uncle Sam's Naturalists. Today he tells me he has been out dove hunting. He didn't kill any doves, but he bagged a few facts about them from a big dove and pigeon man in the United States Biological Survey. ----- You tell 'em, Mr. Wilds Man ------

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I guess we all know something about mourning doves.

Mourning doves are old familiar friends of ours.

I wouldn't think of telling you sportsmen, who love good shooting at fast flyers, anything about doves.

The mourning dove is the turtle dove. All lovers know the mourning dove, with its sweetly sad, cooing love-note.

And all lovers of bird beauty have admired the soft, delicate coloring and trim form of the dove. It is the very symbol of beauty, love, and peace, not only between lovers, but between nations.

The more practical minded recognize that mourning doves are friends of the farmer in destroying an enormous quantity of weed seeds. Mourning doves nest throughout the entire United States. A pair will raise from 3 to 5 broods in a season.

In many place, we are so well acquainted with mourning doves, the same individual mourning doves, that we regard them as part of the place. However, Mr. Frederick C. Lincoln, the dove and pigeon expert of the United States Biological Survey, tells me that doves do migrate. From his bird-banding work he has produced the final proof that the flight of mourning doves is both interstate and international.

A mourning dove banded at Fort Riley, Kansas, was shot in southern Mexico. Many of those banded in Northern States have later been recovered far away in the South. Most of the mourning doves that breed in the Northern States, Mr. Lincoln says, apparently spend their winters in the States of Georgia, Louisiana, and Texas. Georgia seems to be the favorite wintering ground for them. Doves from Illinois, Michigan, Indiana, Ohio, Pennsylvania, New York, and New Jersey have been found in Georgia. Only those bearing the numbered bands put on them in Illinois and Ohio have so far been found in Louisiana. But Texas attracts doves from South Dakota, Iowa, Kansas, Missouri, Illinois, Indiana, and Ohio. There are some scattered returns from States in between.

This system of catching birds and putting numbered bands on them and noting the time and place has also shown conclusively that mourning doves do return to the same fields year after year. Knowing that there is a tendency for birds reared over a widely distributed area in the northern part of their range to congregate in a relatively restricted region in the South many prove a highly important help in taking effective steps to protect them. But why do mourning doves mourn?

Mr. Lincoln says that is just their mating song. They don't seem really to feel sad about it. On the contrary, they appear highly pleased. Of course, that sad, sweet cooing is heard quite often.

Mourning doves earn their reputation for affection, too. Mr. Lincoln says they are very demonstrative. They spend plenty of time billing and cooing. However, it is a little harder to see how they ever became a symbol of peace and good will. That is a modern idea, and Mr. Lincoln has not been able to find it in ancient bird lore and legends. As a matter of fact, he points out, when two male mourning doves got to fighting over a lady friend, they are most vicious fighters. Unlike most birds, they will often fight till one or the other is killed.

The love-nest of a mourning dove is a notoriously flimsy affair. It is a little more than a platform of loose sticks. The miracle is how it keeps together and what keeps the eggs from falling out. Usually the doves build in low trees, and Mr. Lincoln says that many times he has looked up under a dove nest and seen the two little pure-white eggs plainly visible through the bottom of the flimsy nest.

After the eggs have hatched, during the first few days in the life of the two dove squabs, they are fed on "pigeon milk." Some folks seem to think "pigeon milk" is a joke. Mr. Lincoln tells me however, that "pigeon milk" is a very good name for that first food for young mourning doves. What it really is is the lining of the crop of the parent bird, which peels off at this time, and looks very much like cottage cheese.

As the birds get older, the "pigeon milk" becomes mixed with seed softened by it, so the young birds gradually get used to a full seed diet. Calling it "pigeon milk" in the case of doves is not incorrect, because a dove is a pigeon, or rather the pigeon is a dove. The pigeon is nothing but a domesticated blue-rock dove of Europe. It is much bigger, but looks very much like the wild bird. Our mourning dove is a close cousin to it.

Our mourning dove is also first cousin to that other dove, the famous passenger pigeon, which Father used to kill by the hundreds with a fishing pole, and grandfather claimed he had seen flying in such big flocks as to throw a shadow on the earth for hours.

In fact, even yet, folks every once in a while report that they have found a passenger pigeon. It always turns out, however, that the find is only an extra big mourning dove, a band-tailed pigeon, or something other than the passenger pigeon. There are no more passenger pigeons. The last of those big doves died at the Cincinnati Zoo in 1914. Now the stuffed skin of that last passenger pigeon can be seen in the United States National Museum at Washington. The last of its race, it stands a sad reminder of the extinction of a species.

Passenger pigeons laid only one egg to a nesting. They bred in vast colonies, and were easily trapped and killed off in large numbers. They couldn't stand it. Our mourning dove, just about half the size of the passenger pigeon, hatching two eggs at a time instead of one, breeding in scattered localities over a wide range, and gathering for migration only in small flocks, has a much better chance for survival. There were once probably 10,000 passenger pigeons to one mourning dove. The passenger pigeons are no more. But the mourning doves are still plentiful.

However, Mr. Lincoln points out, that because of its arrow-like flight at 30 to 40 miles an hour it is a favorite with hunters, and because it is such good eating, it also has many other natural enemies. We will have to watch our beautiful mourning doves carefully if hunting is to continue. They must be protected from over-shooting.

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ANNOUNCEMENT: The Wilds Man will be back two weeks from today. Remember the day and hour, and be on hand with Station------- for one of these visits with Uncle Sam's Naturalists in the United States Department of Agriculture and the woods and fields lying all around this big game preserve of ours.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
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WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, August 15, 1930

ANNOUNCEMENT: Our Wilds Man is with us. He has just been on one of those visits with Uncle Sam's Naturalists. This time, it was to the United States Forest Service. What the foresters told him about the Wilds, he will now tell us ---- As you know, this feature is presented by Station -------- in cooperation with the United States Department of Agriculture, once every two weeks --- Well, Mr. Wilds Man? ----

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We all recognize the old saying that "great oaks from little acorns grow."

We realize that little trees are the stuff that big trees are made of. Yet, I venture to say, most of us think of the forest as being pretty much the same, not only year in and year out, but for ages upon ages. Of course, young trees grow old, and old trees die. But new trees take their places. We usually think of the woods as something permanent.

However, Mr. G. A. Duthie reminds us that forests are in a constant process of change. The very character of the trees changes at times. Nature herself has a way of rotating the tree crops in the woods. Mr. Duthie has just joined the Public Relations Branch of the Forest Service at its headquarters in Washington. For some years, he has lived among the trees of our National Forests in the West. Maybe that is why he sees these changes so clearly. His work has taken him among our fossil forests. He has been able to compare the trees which grew millions of years ago with those growing today. But all those changes haven't taken place in the prehistoric past. Natural tree crop rotation can be seen in many parts of our woods even now.

As Mr. Duthie was telling me all this, the thought of those giant redwoods of California towered up in my mind. Those trees certainly have been there for some time. They don't suggest any change in tree crops. Some of those now standing have been there hundreds, and even thousands of years.

To Mr. Duthie, however, those redwood forests suggest that conditions on the Pacific Coast have been pretty much the same for a long time. Where the big trees grow, the rainfall is heavy. The heavy rains, and ocean fogs in which these forests are often bathed have helped keep down the danger of fire.

That is the heart of this question of the changes in the type of trees in the woods. The trees fit conditions. When conditions change, the tree crop changes. To produce the right conditions, there is often need for the association of various plants together. When those conditions are upset by a fire or a flood which destroys rich plant food or washes it away in the top soil, the conditions are so changed that they are not longer suited to growing the same kinds of trees. The same is true after destructive logging.

When such a catastrophe happens, a crop of weed trees comes in and takes possession of the ground. Those weed trees, such as aspen, and paper birch, scrub oak and other inferior or scrubby species, take the place of the more valuable species which predominated in the original forest.

Those weed trees act as a sort of nurse crop, for the better species which grew there before the catastrophe.

Those weed trees, you see, help stop the erosion or washing away of the soil. Their leaves gradually build up a new leaf mould on the forest floor. Their shade protects the land from baking. In other words, they gradually build up better conditions for the better, stronger trees which require better conditions.

Then the valuable pine or oak or spruce, as the case may be, in different localities, begin working into the sides of the land where those trees had been replaced by the weaker weed trees. They get in possession of part of the ground covered by the nurse crop. They force their way up. They overshadow the scrub or weed trees. They crowd out the weed trees, and regain the ground which their kind once occupied.

That takes time. In any case, Mr. Duthie says, it will take fifty to two hundred years for a valuable species to begin to take over the ground again. That is why he speaks of floods and fires, and short-sighted timber cutting as catastrophes.

As a rule, fires cover much greater area than floods. But since the forests began there have probably been fires and floods at times, but not nearly so many as now when man has added his destructive work to that of nature, by clearing the forests and setting fire to them in one way or another.

When the white settlers first hit this country, Mr. Duthie thinks that most of the forests they found here were of the ultimate types of the best species of trees. Of course, here and there there were undoubtedly some burned-over lands on which weed trees were predominant. But, taken by and large, the forests were at their best.

In cutting, the tendency, Mr. Duthie says, has been to take the most valuable trees, regardless of consequences. As a result of such

indiscriminate cutting of the best, inferior trees are given the advantage. They take that advantage, and reproduce their kind to the exclusion of the better species.

For example, in our western forests, the inferior white firs have crowded in on valuable pine and Douglas fir in many sections. In the Rocky Mountains, great areas of forest lands have been burned over and pines and spruces destroyed. The land has grown up to aspen, and paper birch, and mountain mahogany, none of which produce merchantable timber.

Throughout the Lake States region, there are large areas which once bore valuable stands of white and Norway pine, but have now been taken over by popple and jack pine.

In northern New England, where red spruce is the most valuable species, it has to fight inferior hardwood species which tend to take possession of the land.

In the central Appalachian hardwood belt, on the other hand, the scrub oak, which is an inferior species, tends to crowd out tulip, and white oak, which are valuable species.

The problem of the foresters in all our forests is to give preference to better species, and to protect the most valuable trees so as to bring about the establishment of an ultimate stand of the best trees at the earliest date.

One way of doing that is to insist upon the removal of all inferior species and to leave only seed trees of the most valuable species. On cut-over or burned-over land, the foresters also resort to replanting with the kind of trees they want to grow. When the balance of Nature which maintains the forest in its best crop, is upset by fire or flood or foolish cutting, Mr. Duthie points out, Natures slow method of crop rotation may mean heavy timber losses for many generations of timber users.

ANNOUNCEMENT: Every other Friday Station_____ presents these results of visits with Uncle Sam's Naturalists, in the United States Department of Agriculture. Remember the day and hour when our Wilds Man will bring back the game.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS.

Friday, August 29, 1930

ANNOUNCEMENT: Our Wilds Man has been on the trail of some Big Game. He has been talking to Uncle Sam's Naturalists in the Bureau of Biological Survey. Now he is here for his regular once-every-two-weeks talk to the listeners of Station------Buffalo, elk, antelope, moose, mountain sheep, and musk-oxen are among the animals he has been trailing------ Well, Mr. Wildsman, how is our big game getting along?-----

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Yes, I've been inquiring around about our big game.

I was asking Mr. Talbott Denmead, the assistant U.S. Game Conservation Officer, about how our buffalo were getting along. You know, our American bison, or buffalo, was on the verge of being completely wiped out. Now on four big game reserves administered by the U. S. Bureau of Biological Survey, we have about 600 buffalo, all told. That's not many compared with the thundering herds that shook our prairies back in the days when Buffalo Bill took his famous meat contract. But it is enough practically to save the buffalo from extinction.

Mr. Denmead tells me that we could double the size of our buffalo herds every two year. But if we did, they would starve to death. We don't have the range for them. All in all, including those on government preserves, on private ranges, and in zoos, there are three to four thousand buffalo in the United States and about fifteen thousand in Canada--perhaps 19,000 in existence today. The Biological Survey has concentrated on small herds, and on keeping the stock pure.

About 22 buffalo have been turned loose in Alaska, and several young have been born there. But under present day conditions in this country, Mr. Denmead says, we just can't let buffalo run loose. A buffalo bull, almost twice the size of an ordinary bull, can do a good deal of damage. A scared or enraged buffalo will trample down almost anything that gets in its way and will attack horses. Remember, buffalo used to range over a wide territory. If we let them loose, Mr. Denmead says they'd start out and never come back.

As to elk, it is not so necessary to keep them fenced in. In handling them at the government Elk Refuge at Jackson Hole, Wyoming, we don't fence the elk, we fence the hay to feed them. The elk travel considerable distance. There are several thousand of them in and about Yellowstone National Park. They won't stay in the park in the winter time, but gather in big herds, and some come down from the mountains to the Elk Refuge for food. In order to save our elk from starvation, Mr. Denmead tells me, alfalfa is grown and stacked up behind fences to be on hand to feed the hungry elk in winter when they come down from the park. Last year, nearly seven thousand elk were fed at the Elk Refuge.

And, by the way, that habit of migration in big herds makes it comparatively easy for the biologists to keep tab on the number of elk.

Our biologists seem practically to have saved buffalo and elk from extinction. They are now taking steps to save the mountain sheep and antelope. Mr. Denmead says that the Biological Survey now has about 100 mountain sheep and 50 antelope on the preserves under its care.

Of all our big game at present, Mr. Denmead holds, the antelope is most likely to become exterminated. Antelope are delicate and hard to handle. They get their slender legs broken very easily. As a means of protecting the mountain sheep and antelope, steps are now being taken to procure a big preserve where these animals can range under natural conditions. It is planned to set aside such a range for them in southern Idaho, southern Oregon, and northern Nevada.

Dr. W. B. Bell, in charge of the biological investigations of the Biological Survey, tells that all game studies indicate that the more nearly we approach natural conditions for the game animals both summer and winter, the greater prospect there is of keeping them in healthy, vigorous condition.

That involves more than you might think. With the increase in human population and more intensive use of land, the need for protection of wild life becomes each year of greater importance. That need has led to the establishment of reservations in different parts of the country to provide protection for certain animals.

To keep the animals fit on a limited range, that range has to fit the animals. For that reason, the scientists have made a study of the food habits of the game and the quality of forage furnished by the range. In the case of elk, that has involved a detailed study of the nutritive value of the different plants growing on the range. It has meant searching out poisonous plants, and analyzing salt licks to determine what minerals they contain. It has meant an investigation of the diseases and parasites that attack the elk. One of the most important diseases of elk was discovered to be induced by squirrel-tail grass in the hay used for artificial feeding during the winter period.

But the work of the Biological Survey with big game animals is not confined to preserving the remnants of the once huge herds that roamed our territory. Dr. Bell tells me they have undertaken to bring back one big game animal in Alaska that was wiped out about seventy-five years ago-- the musk-ox.

The last musk oxen in Alaska were killed off about 1850 or 1860. There are still some left in northern Canada and eastern Greenland, and on some of the Arctic islands.

Now it is planned to bring thirty musk-ox from Greenland. The purpose is to restock certain parts of Alaska with musk-oxen, but not as game animals. The idea is to start herds of musk-oxen as domestic meat cattle able to stand the rigors of winter in some of the cold sections of Alaska.

Musk oxen tend to run in close herds. They are expected to be as easy to handle as cattle on the range. They are largely grass eaters, and so use a different type of forage from reindeer, which have proved so successful

in our great northern Territory!

As you recall, reindeer were imported in comparatively small numbers. They increased remarkably. Now they form the big livestock industry of Alaska, and reindeer meat from those vast herds is found on the bill-of-fare of hotels in our leading cities.

The idea in starting reindeer raising was somewhat the same as the plan now to start musk-ox herding, that is, to get a native meat animal suited to Alaskan conditions. I say 'native' meat animal, because the reindeer is practically a native. It is a very close relative to the native Alaskan caribou, and was known to be adapted to similar range.

Alaska has vast yields of forage. With the musk-ox industry the experts hope to make efficient use of parts of that tremendous supply of forage, which can not be used by the remarkable reindeer-raising business.

The musk ox is not the only former game animal that may be domesticated. Dr. Bell tells me still other parts of Alaska's vast and varied ranges may be used to support large numbers of mountain sheep. Plans are already under way to add mountain sheep to Alaska's growing livestock resources. Mountain sheep have hair, not wool. If experiments are successful, they will be grown in domestication for meat and hides. And, they do say, that mountain sheep is one of the finest meats to be had anywhere.

So you see, in its investigations of wild animal life, the U.S. Biological Survey is working to meet the needs of the work-a-day world as well as the needs of the sportsman and the lover of the wilds.

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ANNOUNCEMENT: You have just listened to the report of a talk with Uncle Sam's naturalists of the U.S. Biological Survey. This feature is presented once every two weeks as part of Station ------ and the United States Department of Agriculture's service to their radio audience.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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WITH UNCLE SAM'S NATURALISTS. Friday, September 12, 1930.

ANNOUNCEMENT: Our Wilds man is back from another visit with Uncle Sam's naturalists. This time he is going to come out from under the trees, and tell us what a Forester has told him about the grasses which carpet the range and furnish feed for cattle -- That is, some time they do, and some time they don't. All right, Mr. Wildsman, we are ready to go to the roots of this matter ---------

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That's the way with some folks. They think of pasture and range grasses as just so much feed for cattle. And at that, they often overestimate the quantity ---- But more of that later. -----

You might say a lot of people don't even really think of the plants, they think of the cattle. At the first signs of green in the spring, they often turn the cattle out on the range. As long as the cattle seem to be doing well, they don't worry about the plants. They seem to figure that if the grass is grazed a little short, then they can take the cattle off, the grass or other forage plants will grow right back; and that will be all there will be to it.

According to Mr. W. R. Chapline, the senior inspector of grazing in the United States Forest Service, this big question of grass is not so simple. Yet it is a whole lot more interesting.

The plants are living, growing, struggling parts of the wild life on the range. They have their ups and downs. They have their keen competition one with the other. There are also different types or groups of plants on different kinds of soils.

Let's leave the cattle and sheep out of the picture for the present. The plant life on the range fits the soil on the range. But the soil changes. The plants change it. The plants themselves, by adding humus to the soil when they rot, change the physical and chemical make-up of the soil. They prepare the way for new and higher forms of plant life. There is a more or less regular replacement of one type of plants by another.

Let's start with the bare rock. Nothing but the lichens and mosses and other low, less valuable forms of plant life can get a start there. Occasionally, in an extra thick cushion of moss or in the crack of a rock, an early-maturing annual herb will find its way. Those first herbs must be able to grow in the shortest possible time with the least moisture. The sparsely scattered herbs are the next step up in wild plant life.

Now we come to the first-weed stage. The soil is still very poor, of course. There is very little moisture in it. Most of the plants are

shallow-rooted, early-maturing annuals. They are thicker than they were. They may cover almost the whole soil surface at the top of the season.

When frost comes, those plants curl up and die and leave the bare soil exposed. Here and there, you may notice for the first time a few aggressive drought-resistant, short-lived perennial grasses and weeds. That stage of plant life might afford a little, poor forage, if you turned the stock on it at the right time. But let's hold our horses-and cattle.

Now we come to the second-weed stage of life on the range. The soil is pretty well decomposed. Being moderately well filled with plants remains, it is fairly moist. Under such conditions, a stand made up mostly of weeds, with scattered mixtures of bunch grasses, take possession. There are not enough grasses to form a sod, but the interlacing roots bind the soil firmly.

That second-weed stage prepares the way for the next set of plants which form the final or top stage in the progressive development of the range. Now the soil is in condition for the grass cover.

In a vague, general way that is the usual process of change for lower forms to higher plant life. -----

Now let's turn our cattle out on one of these higher types of vegetation on the range. Sometimes I think cows and sheep are like people, and sometimes I think people are like cows and sheep. Remember, there are a number of different kinds of plants. Some are better than others. Taste better. At least, the animals seem to think so. They don't eat all alike. They have their preferences. Taken by and large, they eat the best first.

That may be all right. As long as that high-type feed is not too closely grazed. When the animals get to grazing the green feed of the choice forage plants nearly as fast as it grows, they may get enough to eat for the time being. However, when they strip the leaves from a plant, they rob it of its food factory.

You may not notice the change any one year. To the casual observer, it looks like there was plenty of forage. You may not notice that the best type of plants are becoming fewer and fewer. In a period of, say five years, you may begin to realize that the better forage plants are much fewer, if not all killed out. Their place has been taken by less desirable grasses and weeds.

"Less desirable" is a mild term for some of those plants. Often, poisonous weeds replace valuable feed plants. Then there may be a lot of sheep or cattle killed outright.

Anyway, you can see what happens if that killing off of the best plants keeps up. When the best are gone, the animals will take to the next-best. And so on, down the line. All the time, the livestock are getting less feed and poorer quality feed. Overgrazing has reversed the order of development. Instead of going from lower to higher, the plant life on the range is going from higher to lower.

For example, the grazing of livestock may change a pure grass cover to a cover of mixed grass and weeds. Or it may cause an entirely new plant cover to come in. Sometimes, the top stage of plant development on the range is destroyed without making much change in the soil. In that case, the better type plants come back again soon. But on hill-sides or other exposed lands, where the destruction of the cover from over-grazing leads to the washing away of the rich upper soil, the character of the plant life is shoved further and further toward the more primitive forms which cling closely to the almost bare rock.

You can't tell simply by looking at the stock whether a range is overstocked or not. The wise cattleman not only regulates his grazing with an eye on the condition of his stock, but to the condition of the range as shown and the character and condition of the plants.

There has been a gradual and steady decline in the carrying capacity of many of our native pastures, Mr. Chapline tells me. In order to improve and maintain pasture lands, we have to give the forage plants a chance to make a big growth before being grazed and occasionally to produce fertile seed crops. To give the best plants, the kind the cattle like best, the chance they need, Mr. Chapline explains that the Forest Service on its national forest ranges tried to prevent too early grazing, and avoids over-grazing by proper numbers and distribution of the stock and by withholding part of the range from grazing until after seed maturity each year.

When that is done, the range plants come back practically as fast as where animals are kept off the lands all the year around. From what he says, it seems the cattle can have their pastures, and graze them too, if the stock-man manages with an eye to the good of the plants on the range as well as the good of the cattle.

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ANNOUNCEMENT: Every other Friday, Station------ presents these results of visits with Uncle Sam's Naturalists of the United States Department of Agriculture. Remember the day and hour when our Wilds Man will be back.

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UNITED STATES DEPARTMENT OF AGRICULTURE

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WITH UNCLE SAM'S NATURALISTS

Friday, September 26,1930

ANNOUNCEMENT: Our Wildsman has been talking with Uncle Sam's Naturalists about why the bag limits on ducks and geese have been cut down this year.--- Well, now Mr. Wildsman tell us; just what do the experts of the United States Biological Survey say?--- Why are they cutting down on the number of ducks we can kill? -------

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Thanks, for the compliment!

The new regulations for hunting ducks and geese are not going to cramp our style very much.

The bag limits on ducks have been reduced from 25 to 15 a day. The limit on geese has been cut from 8 to 4 a day. And we can't have more than two days' bag in our possession.

If some of us ever ever shot 15 ducks in one day's hunt, we certainly would knock off to celebrate. Of course, on some of the important winter concentration areas, we might get that many ducks. But that wouldn't be sport, that would be slaughter.

In fact, Mr. W. C. Henderson, the associate chief of the Bureau of Biological Survey, tells me that even the experts are a little doubtful whether cutting down the bag limit is enough to protect the ducks and geese. It may be necessary to shorten the open season, or to establish huntless days, or to limit the artificial methods of bringing the ducks and geese within range of the shooting stands.

It seems from what he says that our wild-fowl guardians are considerably worried. Estimates made from reports two or three years ago seemed to show that ducks were on the increase. But the past two years have been hard years on ducks. Reports received from State and Federal men who spend much time in the marshlands show that there was a decided decrease in ducks and geese generally throughout this country. Hunters say the same.

One cause of that was drought in Canada last year. Probably about three-fourths of North American ducks breed in Canada. A duck out of water is in a bad fix. The food supply of ducks on their breeding ground grows mostly in the water. When the ponds and sloughs and marshes dry up, the supply of food for the young and old ducks is cut down. When times are hard for ducks, there are fewer of them to make the long trek South to their feeding grounds in this country.

And we have hardly had what you would call good weather for ducks and duck food in this country or in Canada this past summer. The ducks that don't breed in Canada, breed in the United States or Alaska. Recently it has been going hard with ducks in Alaska for another reason. Coyotes have invaded wild-fowl breeding grounds, and killed off large numbers of the birds.

You might figure that Nature left to herself might possibly repair the damage in time. The trouble with that theory is that Nature is not being left to herself. While the duck population is being killed off by adverse natural conditions, we have been crowding in from all sides, as it were. We have drained marshlands to make way for farms and homes for our human population.

That kind of thing has gone so far that in order to preserve our wild fowl we have had to set aside "landing fields" for ducks and geese along their chief migration routes. Canada is doing her part along that line too. During the past year, she has established five bird sanctuaries and one public shooting ground in the important duck regions of four Canadian provinces. Our Biological Survey, Mr. Henderson tells, is now buying up lands for additional refuges. States, and conservation organizations, and individuals have also begun to attack this problem of providing feeding and resting grounds where large numbers of ducks may be safe from shooting at all seasons of the year.

That is certainly a big and important step if good duck hunting is to continue. But such a program takes time. In the meanwhile, we are getting more and more hunters, and fewer and fewer ducks and geese. Automobiles and good roads these days enable hunters to get to the shooting grounds more easily.

In recent years, Mr. Henderson says, there has been considerable growth in the number of commercial shooting clubs. These clubs get the shooting privileges over areas of marshland. Then they install equipment to house and entertain hunters. They advertise the quality of the shooting, and resell the privilege of hunting to visiting gunners. Sometimes the owners of such resorts put immediate profit above everything else. What it amounts to, is that they encourage intensified shooting and bigger destruction of the birds.

That is not all. There are also the pot-hunters. Not the individual small pot-hunters we have always had, but the commercial pot-hunters and duck market bootleggers have invaded our hunting grounds.

In the last ten years, Mr. Henderson says, the small force of game protectors of the United States Biological Survey has been too small. The losses of ducks and geese through poaching, and snaring, and night shooting, and other illegal practices have increased.

Well, that gives you some idea as to what is behind that lowering of the daily bag limit from twenty-five to fifteen ducks and from eight geese to four and setting the possession limit as two-days' bag.

What is ahead, of course, is going to depend a lot on how our hunters help, and how the new regulations work out. As Mr. Henderson outlines the situation, there are just three things that can be done to maintain the great sport of duck hunting:

First, we can increase the production of ducks in the wild by maintaining refuges on their breeding grounds. The Biological Survey is making progress in that direction as rapidly as possible.

Second, we can provide landing fields for resting and feeding of the birds on their migratory flights. The Survey is working along that line, too.

Both these are long-time propositions. It will take years to do much along that line. The only immediate relief here and now is restriction of the annual kill by hunters. That includes more complete enforcement of the existing law against commercialized hunting and bird bootlegging, and smaller bags by real sportsmen. A lot is going to depend on the sportsmen themselves.

We can rest assured, however, that the experts in the Bureau of Biological Survey will recommend only such changes as the scientifically gathered facts and good hard common sense seem to dictate.

Mr. Paul G. Redington, Chief of the Biological Survey, says that reports received by him directly during a recent visit to Canada, which is cooperating closely with the United States in the protection of migratory birds, showed an alarming condition for the waterfowl on the breeding grounds in Alberta and Saskatchewan as well as in the United States. He has made an urgent appeal to the sportsmen of the country to recognize the situation now menacing the waterfowl and to be governed thereby in taking ducks and geese during the present hunting season.

We always have had duck hunting. Let's hope we always shall. In this connection, Mr. Henderson quoted me a few lines from a report on a game bill in Ohio in 1857, which read: "the passenger pigeon needs no protection . .. the snipe too, like the pigeon, will take care of itself, and its yearly numbers can not be materially lessened by the gun."

Now where are those passenger pigeons? The last pigeon died off years ago, and now it is stuffed and in a Museum, where it is a sad reminder of what has happened to a bird that we thought would take care of itself.

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ANNOUNCEMENT: Our Wilds Man will be back with us two weeks from today. At that time, he will tell us about another of his visits with Uncle Sam's Naturalists, in the United States Department of Agriculture. Remember the day and hour.

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WITH UNCLE SAM'S NATURALISTS. Friday, October 10, 1930.

ANNOUNCEMENT: Our Wilds Man has been in the woods. As usual, he has come out again to tell us about his visits with Uncle Sam's Naturalists. This time he brings us word of some of the recent findings of foresters which may make us change some of our old notions ------ You tell them, Mr. Wilds Man! ---------

******

Our foresters have been looking into Nature's ways of growing trees, in our southern pine region.

They have made some remarkable findings, which may bring about big changes in timber growing; and in the way we think of the woods.

They noticed, that after logging, or after a big hurricane has swept through an old virgin pine woods, the second-growth trees which spring from seed or sprouts on the cut-over land grow faster than the young trees in a virgin forest.

Nothing particularly remarkable about that. That has been a matter of more or less general knowledge.

Nature grows trees together in a thick stand. When the best type trees are thinned out for any cause, weed trees creep in to take their place. Or if the best trees grow closely together, they crowd each other out. They struggle with each other for light, and air, and nourishment. The older trees shade out the younger ones. Trees with only five years difference in their ages may show a tremendous difference in size. In the forest primeval there are giant trees and dwarf trees. To get an even stand of fully developed trees even with such fast growers as southern pines, takes from 125 to 175 years and up in the virgin forest. Prodigal Nature wastes much and takes her time to develop high-quality timber.

Speaking by and large, that is the kind of timber we found here. That is the kind we have grown up with. Nature's long-time timber growing in the original southern pine forest which used to cover 210,000,000 acres stretching from Virginia to Florida and west to Texas, is the kind we think of.

But most of the virgin timber is already gone. Nearly half of the original southern pine lands have been cleared for other uses. What's left is second-growth. There are only 12,000,000 acres of virgin southern pine forests still left uncut. We will have to depend for our future southern pine timber and pulp supply on the second growth and the re-planted forests.

Yet we still think in terms of the "ancestral forest." We think of tree-growing as something which takes several generations of time. When we plant or protect a seedling most of us feel a bit self-righteous. We think we are planting for generations yet unborn. In fact, that feeling has been so strong as to hold back reforestation of many pine lands.

That's why the findings of Mr. R. D. Forbes and Mr. Donald Bruce, of the United States Forest Service, are so important. Naturally, when trees start from scratch, with little competition except among themselves, as they do in second-growth stands, you would expect they would grow a little faster at first.

However, Messrs. Forbes and Bruce did more than just notice that. They measured, and compared, and experimented. What's more, they discovered that a second growth pine stand with proper management and protection, can produce a tree of a given size in half the time required in the original forest. Or even less than half the time.

The time required to grow a crop is further cut by the fact that timber is now used in smaller sizes than it used to be in the days of more abundant supply from the original virgin forest primeval.

That means that the time it takes to grow southern pine for market can be reduced tremendously. As the Forest Service experts figure it, the period it takes to grow a pine tree from seed-time to harvest now falls well within the limits of the ordinary life-time. The man who starts the forest may himself reap the reward. The possible significance of that, in leading folks to think of trees as a crop as well as oats, and wheat and corn, can hardly be exaggerated.

I can see some old hands in the timber business smiling at that. Their experience with timber from second-growth stands may make Doubting Thomases of them. The quality of second-growth timber is not the same.

That's true. Of course, the quality is not as important as it once was. Wood is wood more nearly now than ever before. Quantity is the big thing. Our reckless cutting of timber in the past, has brought us to a point where we can not be so "choosey" as we were.

However, most of our ideas of second-growth timber come from stands of second-growth left to fight it out in thick-stands in Nature's old way. Our forestry experts say that in spite of the comparatively low-grade timber which second-growth now produces, second-growth appears from their experiments to be capable of filling every demand of the future for forest products.

Instead of letting the trees crowd each other, they allow the trees to start in thick stands; so they will shade off lower limbs early in life and so lead to more clear lumber later. Then by judicious cutting, they thin out the stand, with the idea of giving the trees the best chance to get light, air, and nourishment to grow to market size and quality in the shortest time.

In other words, trees are to be managed as a "cultivated" crop. The cultivation consisting mainly of thinning and weeding out at the proper time for quickest growth, and always keeping fire out, of course.

Handling trees as a crop is a comparatively new thing. The point is, that we are learning that we can go Nature one better in producing timber for our purposes, by handling trees as a crop. The Forest Service is experimenting at a number of its stations scattered throughout the country on better cropping methods for timbers of different kinds.

Recent findings show that southern pines produce sawlogs in twenty-five to forty years. And that our two-purpose slash-pine will produce turpentine at twenty years and timber at twenty-five. This gives us a new view of the possibilities which lie in many cut-over sections where farming the land to small annual crops no longer pays, or where the land is unsuited to the plow.

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ANNOUNCEMENT: This Station cooperates with the United States Department of Agriculture in presenting these visits with Uncle Sam's Naturalists once every two weeks.

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WITH UNCLE SAM'S NATURALISTS RELEASE Friday, October 24,1930

ANNOUNCEMENT: Once more the Wilds Man is with us. He has just come from another of those visits with Uncle Sam's Naturalists. He has been angling for facts he tells us, and has brought home quite a mess of them -- But he promises us what he may say about fishes is no fish tale ------ well, Mr. Wilds Man, show us your string -------

****

Old Ike Walton used to say that the art of angling begat habits of peace and patience in those that professed and practiced it. Fishing, he described, as "a calmer of unquiet thoughts, a moderator of passions, a producer of contentedness."

From what I can gather, some of his latter-day disciples have lost that "calmness of spirit." They have gotten all worked up about some of the birds that also like fish. They are not content.

They know that immense numbers of trout fry have been planted in certain streams. Those fish fry have disappeared. What's become of them. Who got them?

Some sportsmen and commercial fisherman have looked around for a culprit. Naturally, their eyes fell immediately on the fish-eating birds, especially on the great blue heron. There he wades on those long legs of his, with that sharp bill of his, ready for business. Or there he rises on those big wings. He is often the biggest, most conspicuous fellow hanging around. And he does eat fish.

The evidence seems as plain as in the case of Cock Robin after the Sparrow confessed. But before we mob the beautiful great blue heron, or any other fish-eating bird, I want to call one witness. That's Mr. W. L. McAtee, of the United States Biological Survey. I call him because he probably has more inside information about birds than any other man living.

But before we go into the evidence, let's have a clear understanding of the charges. The great blue heron and other fish-eating birds are accused of responsibility for the mysterious disappearance of certain fishes. What fishes?

Bear that in mind, please. That's important. The great blue heron is charged with making away with valuable fishes, such as trout. Also bear in mind the place where the crime is supposed to have been committed: that is, in certain natural streams where trout fry have been planted.

Nobody would dare say that the great blue heron doesn't eat fish. The bird is well equipped to do it, and does it. It is also admitted that the Department of Agriculture has issued an order permitting the control of herons and other fish-eating birds about fish hatcheries. They are known to be destructive about fish hatcheries. In localities away from the hatcheries, as we shall see, it is a different story.

The most valuable fishes are few in number compared with the non-commercial species. Moreover, as a rule, the more valuable fishes live in the deeper water, are swifter swimmers, and harder to catch than many of the so-called coarse fishes.

When Mr. McAtee takes the stand, he will tell you that the great blue heron and other fish-eating birds feed on what is common and easy to get. In support of that statement he will cite to you analyses of the contents of the stomachs of 150 great blue herons, made by experts in the United States Biological Survey.

Mr. McAtee will point out to you that meadow mice were found in 8 of the 150 herons stomachs. Other mice were found in 4. Shrews in 5. In fact, forty years ago a law was passed in California protecting the great blue heron on account of its feeding on pocket gophers and ground squirrels.

But we are not going to try to establish an alibi for the great blue heron. We will admit that he was in the locality probably at the very time of the mysterious disappearance of these valuable fishes.

What was he doing there? The inside evidence from those 150 herons will show that this stately bird goes to the streams for other things than fish. Thirty-seven stomachs contained the young stages of dragon-flies. Thirty-three contained crawfishes, nine had giant waterbugs, seven had predacious diving beetles in them. Snakes, frogs, salamanders, and leeches also were found. Remember those items. They are important bits of evidence in favor of the great blue heron, and of other fish-eating birds that eat these along with the fishes.

Yes, these herons have the name for eating fish. But Mr. McAtee will show you that 29 of the 150 dined on suckers, 23 on minnows, 14 on sticklebacks, 7 on darters and carp, 5 on killifish, while sculpins, gars, and madtoms also were found. On the other hand, commercial or game fishes occurred only a few times. Eel was found in 1; grunt in 1; pickerel in 2; trout in 9; sunfishes in 10; yellow perch in 13; and catfish in 17. Sunfishes, of course, are not very valuable either for sport or food, and catfish are notorious spawn eaters.

Then remember those suckers, and minnows, and sticklebacks which form the larger share of the blue heron's fish diet. Those are enemy or competitor fish of the trout. Mr. McAtee says few folks realize what serious destroyers of spawn there are among the suckers, and minnows, and sticklebacks. Evidently from Mr. McAtee's figures, the great blue heron eats scores of the enemy and competitor fishes for every trout that it consumes.

But that's not the whole story. Besides the fish enemies of fishes the streams team with insect and other enemies, such as the larvae of the predacious diving beetles, or "water tigers," nymphs of dragon-flies, giant water-bugs, and crawfishes. As you recall, those trout enemies were found in considerable numbers in the great blue herons examined by the experts.

Now, we begin to clear up the mystery of the disappearance of the young trout. When we look beneath the surface of the water, we see a fierce struggle for existence between the various and sundry denizens of the cool depths. It is fish eat fish.

Studies of trout streams by the Biological Board of Canada show that the greatest losses in trout fry are caused by enemy or competitor fishes.

After hatching, the little fishes are frequently decimated by cannibalistic attacks. And none are worse cannibals than the trout and other game fishes themselves. There among the enemy fishes and other enemies you will find the prime cause of the disappearance of the baby trout.

As for the great blue heron and other fish-eating birds, Mr. McAtee gives it as his well considered judgment from the facts, that in most cases they more than make up for the harm done in eating valuable fishes by their destruction of the natural enemies of the whole fish tribe.

So you see the great blue heron is not guilty as charged. When he was seen hanging around the trout stream he may have been engaged in actually helping, not hurting, the trout fishing.

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ANNOUNCEMENT: Our Wilds Man will be back from another visit with Uncle Sam's Naturalists this day two weeks hence. At that time, this Station---- will again cooperate with the United States Department of Agriculture by giving you another of these glimpses behind the scenes of Nature.

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WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, November 7, 1930.

NOT FOR PUBLICATION

Speaking Time: 10 minutes

ANNOUNCEMENT: Our Wilds Man is back from the woods again. He promised us to bring us a few leaves from the book of Nature. Here in the Fall he should be able to get plenty of them ---- Anyway, he has been talking with some of those U. S. Forest Service experts ----------Well, Mr. Wildsman, what did you pick up this time? ---------

****

Maybe there is a bit of a nip to the wind ---- but there is nothing like being out in the woods these days!

There is life in the air. A fire may feel good after a long tramp or an all day hunt; but we can't forget the woods.

When some folks see the trees in their Autumn burst of colors, they think of the bright yellows and reds as the glorious sunset of the year. As the brown leaves drop, we often think of their job as finished.

However, Mr. W. R. Mattoon, extension forester of the United States Forest Service, has been pointing out to me, there is more to that litter on the forest floor than we sometimes think.

The falling leaves will play several important parts in the life of the forest this winter and for several years to come. And not only in the life of the forest, but in the lives of people who may think they live far from the forest.

Of course, you know, the blanket of cast-off leaves from the old trees, is mighty important to the young seedlings. Many tree seedlings are very tender young things. They are very susceptible not only to old John Frost himself, but to cold in general. Likewise, in hot dry spells in midsummer the leaves keep the soil from becoming overheated.

Then too, the leaves help supply the phosphoric acid the seed needs to sprout. Every leaf that falls gives back to the earth some of the fertility taken away by the growing tree. In other words, the falling leaves help fertilize the forest.

Leaves contain the big three of plant foods. They add nitrogen, potash, and phosphoric acid to the soil.

Of course, you know, we don't ordinarily use the richest soil for growing trees. That is why we can grow a crop of trees on land which it may not pay to farm in field crops.

But that doesn't mean that trees don't need plant food. The leaves that fall this fall form a layer on top of leaves which fell last fall. In the unburned forest, there is an accumulation of several years leaf litter on the floor of the woods.

Mr. Mattoon called my attention to the layers of leaves laid down in the woods, in different years. You may have noticed them. The different layers are different color and texture. It is often very plain where one layer of leaves ends and another begins. And, by the way, Mr. Mattoon suggests that is why cattle often do so much damage when left to run in the woods. They kick up and break up those regular mats of leaves. Once loosened up, the winds and water can get hold of the litter and sweep it away, and expose the roots of the trees to damage from trampling and injury from excessive drying.

That damage shows up in the "stag-headed" tree tops often seen in woods, which has been heavily grazed by livestock.

In order to find out just how much plant food one year's fall of litter in the pine woods amounts to, the foresters at the Lake States Forest Experiment Station in Wisconsin laid down strips of burlap on the forest floor, and then a year later came back and collected the litter which had fallen in the meantime.

They had that litter analyzed by the chemists to see just how much plant food was in it. They found there was about fifteen pounds of nitrogen alone in the litter which fell on one acre. When you figure that in an unburned forest there is an accumulation of litter and leaf mold for almost a decade of years, you begin to realize what damage a little ground fire burning up the leaves on the floor of the woods does, even if you don't count the direct damage to the trees. At that rate, a fire that destroys the accumulation of leaf litter robs the soil on an acre of woods of from 50 to 2 or 3 hundred pounds of nitrogen. It takes from $9 to $50 worth of sodium nitrate to make up for that.

With other leaves in other woods the figures might even be bigger. I just mention that to remind you that the leaves we think of as discarded by the trees still have a considerable value to the future crops of wood..

Those same foresters soaked part of that litter in water for a couple of days. They wanted to see just how much water it would hold. They found that a ton of dried litter can absorb a ton and a half of water. But the amount of water actually soaked up by the pine needles or by the broad leaves of our hardwood trees is not the whole story of water in the woods.

Even after the leaves and other litter on the forest have soaked up all the water they will hold, they will still serve to block the flow of water and filter out of it the soil particles which would otherwise be washed away. The leaves beside adding food to the soil also serve as soil-saving dams.

All of us have seen a few leaves caught in the path of a tiny stream and half covered with soil captured from the running water. To a greater or less degree, the leaves which cover the forest floor act in much the same way. The litter is a vast filter for the water which percolates through it.

In fact, Mr. Mattoon holds that the mechanical effects of the leaves in mulching the ground and checking rapid evaporation and making a soil filter, are much more valuable than the actual chemicals the decaying leaves return to the woods for fertilizer.

They serve as a tremendous reservoir to store up and hold back the flow of water and soil. In that way, the blanket of leaves in the woods indirectly helps protect lands outside of the forest, or cultivated land lying below the woods, from washing. It helps in two ways. It helps by actually reducing the amount and the cutting speed of the water which comes from wooded land. And by filtering the water in the forest, it enables the water to sink into the soil more readily instead of running off.

Muddy water seals up the soil pores over which it passes. Water filtered through the leaves and other forest litter is kept clean and does not clog up the soil pores; and so has a better chance to sink in.

But those Autumn leaves lying there on the forest floor season after season until they become an indistinguishable part of the soil itself, add organic matter to the soil. They improve its workability. These leaves and twigs and the like loosen the soil, de-compact it. They help put the soil in condition for the trees to get at the plant food and make the soil easily penetrated by roots from seedling trees, and the like.

And so you see that in the well-advertised fall, the leaf "may be down, but it is never out", it keeps on helping in the growth of the woods.

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ANNOUNCEMENT: Every other Friday Station___presents these results of visits with Uncle Sam's Naturalists, in the United States Department of Agriculture. Remember the day and hour when our Wilds Man will be back.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

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WITH UNCLE SAM'S NATURALISTS Friday, December 19, 1930.

NOT FOR PUBLICATION

SPEAKING TIME: 10 Minutes.

ANNOUNCEMENT: Our Wilds Man has again been with Uncle Sam's Naturalists of the United States Department of Agriculture. To listen to his talk about reindeer and the like, he has evidently come away filled with the Christmas spirit --- Well, Mr. Wildsman, go ahead --- Let the sleigh bells jingle! ---

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We've had a big argument at our house.

Son insists Santa Claus is going to use an airplane this year.

I stick to the old sleigh.

Of course, I haven't committed myself as to whether or not he is coming at all, but why would he give up reindeer now? From what Dr. W. B. Bell tells me the prospects are bright for bigger and better reindeer. In fact, the United States Biological Survey now has produced them. Dr. Bell is in charge of that bureau's division of biological investigations, and he says that they are now about ready to put some of those improved reindeer into the regular domestic herds of Alaska, to further build up that big livestock industry in our northern territory.

Up to now, the experiments have been conducted chiefly on Nunivak Island, in the Bering Sea, off the West Coast of Alaska. Wild caribou bulls have been crossed with reindeer Does to produce crossbred animals, which weigh more, are more vigorous, and are better meat animals than the regular reindeer.

Of course, the caribou are close kin to the reindeer. They are native of our North country. There were no reindeer in Alaska until 38 years ago. In a few years, 1,280 reindeer were brought from Siberia to Alaska, as a means of increasing the dwindling meat supply of the natives and lifting our Eskimos from hunters to herders. Now there are about a million reindeer in the territory, making available hundreds of thousands of pounds of reindeer meat for the people of Alaska, and some of it reaches

the United States' markets every year. Reindeer raising is getting to be a big business.

That is why these experiments in crossing reindeer with caribou are so important. One of the reasons why the Biological Survey picked out an island for its experiments was to prevent the caribou bulls from wandering off. Reindeer herds also move about from place to place in search of food, but they are not such gypsies as the caribou.

The long, and sometimes uncertain, migrations of the wild caribou at times baffle even native hunters. Some years, the caribou fail to show up along their usual travel routes, and the natives waiting for them are faced with famine. In addition, the caribou have practically disappeared from large areas of Northern Canada. So even now a big herd of reindeer is being slowly driven across country from western Alaska on a two-year trek to the MacKenzie Valley of Canada. The herd is about half way now. Those reindeer were bought from one of the big commercial reindeer raisers of Alaska, by the Canadian Government which plans to use the imported animals in building up a livestock industry among its Eskimos and Indians, in somewhat the same way we have done in Alaska.

Maybe you are wondering, as I did, about the experiments in crossing caribou and reindeer. Suppose, in breeding up the reindeer-caribou of Alaska, that the caribou wanderlust is also bred in them?

It may be that the caribou on Nunivak Island, with no way to get off the island, will ultimately lose their travel urge. Dr. Bell says that wild caribou sometimes join the domesticated herds of reindeer on the range, and stay with them. But he admits that this is one of the things they are watching in the breeding work. Another thing is the effect on the quality of the meat. As a basis for comparing reindeer meat with the meat from the new animals to be developed, the reindeer meat has already been thoroughly analyzed and subjected to various cooking tests.

Other questions to which our scientists are seeking the answer include the best mixture of caribou and reindeer. Will one-quarter reindeer blood, or one-eighth reindeer blood, be better, everything considered? Then there are questions of whether to fatten before shipping or slaughter. And if so, how? And how long?

When I see a picture of Santa Claus dashing over house-tops in his reindeer-drawn sleigh, I think of the reindeer industry of Alaska. When I think of how in less than 40 years it has grown from a few hundred to many hundreds of thousands of animals, and that these have changed the very character of life of the natives and others in our northern Territory, it is then that the Santa Claus picture begins to change.

Old Santa's fat figure lengthens out into that of Uncle Sam. And the merry elves who ride with him change to laughing little Eskimos. And this year in the role of Santa Claus, Uncle Sam is carrying another Christmas gift to Alaska. And you might say reindeer are pulling the new gift. Certain it is, that the astonishing success of the reindeer introduction in Alaska has had a lot to do with the new plan.

That plan is ultimately to provide another range animal industry by reestablishing the musk-ox in Alaska. The Biological Survey has recently brought 34 musk-oxen from Greenland, by way of Norway and New York to Seattle, Washington, and Seattle to Seward, Alaska, and inland to Fairbanks, and all this without losing a single animal from any cause.

At Fairbanks the Bureau has begun experiments to determine the possibilities of domesticating and breeding the Greenland musk-oxen in Alaska.

Dr. Bell says that the musk-ox has long been accustomed to even more rigorous weather than the reindeer or caribou can stand. In its heavy coat of wool and long hair, it is well protected against the cold. Being a grass-eater, instead of a browser and eater of lichens or moss, as is the reindeer, it is adapted to a different character of range from that used by the reindeer.

That's what it will be; new kind of range livestock. In the wild, it has the habit of herding with its kind, so it would seem that these animals lend themselves to handling as range cattle.

There are plenty of fine range grasses in Alaska of the kinds these animals like. In fact, although the idea of raising musk-oxen as more or less domestic animals is new, the animals themselves are not new to Alaska. Natives of Alaska say that their grandfathers killed musk-oxen in the region south of Point Barrow a few generations ago.

If all goes well with the experiment, the newly introduced animals will be the foundation herd for another meat industry for Alaskans. And not only will they be used as meat animals, but the hides and wool may also be used. The wool is not like sheep wool, and Dr. Bell says tests will have to be made to determine uses for it.

Anyway, you see what important gifts the reindeer steeds of Santa Claus have brought and are bringing to Alaska.

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ANNOUNCEMENT: Whoa, Dunder! Whoa, Blitzen! I guess we get out of Santa's sleigh right here. Your Wilds Man will be back with another talk with Uncle Sam's Naturalists of the United States Department of Agriculture two weeks from today.